International Journal of American Linguistics

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THE INTERNATIONAL JOURNAL OF AMERICAN LINGUISTICS was founded in 1917 by Franz Boas and designed for the publication of data referring to American Indian languages. After forty years of exclusive devotion to those languages, the scope of the Journal is somewhat enlarged: to include papers on languages outside the Americas where such papers illustrate points of theory, method, and technique which have some bearing on American Indian linguistic research. The Editor will invite such contributions and will welcome correspondence from contributors who wish to publish their work in IJAL.

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International Journal of American Linguistics

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SIMILARITIES BETWEEN THE ASIATIC AND AMERICAN INDIAN LANGUAGES

TADEUSZ MILEWSKI

KRAKOW, POLAND

1. Recent ethnologic investigations carried out by Gordon F. Ekholm, George Carter, Robert Heine-Geldern and others have pointed to the existence of distinct similarities between the culture of the American peoples before the coming of the whites and that of Asia and Oceania. It results either from mutual contacts or independent but parallel evolution. Thus far it is impossible to establish which of the causes was the source of the coincidences. Perhaps both were at work. Anyhow, these similarities deserve careful consideration.

Moreover, it may be interesting to note, the same coincidences are found in the sphere of linguistic facts. Striking structural similarities whose origin may be conceived in different ways occur between some Asiatic and American Indian languages.

Similarities between such geographically distant languages may be of different origin. We must distinguish here four essential cases: 1. Languages similar to each other may continue their common parent language as with the Indoeuropean languages used today all over the world. 2. Similarities are due to old contacts of languages used in the same area constituting a geographical unit. Under the circumstances they formed a Linguistic Area with common structural features, like the Balkanic Area. Later on ethnic shiftings separated the old members of the Area though some common features were preserved in their structure. 3. Transoceanic contacts might have transferred single words together with cultural products from one country to another. 4. Coincidences following the independent development of distant languages are possible, too.

Similarities occurring between the Asiatic and American Indian languages may result from two kinds of contacts proceeding from two different epochs: the older one from before 1000 B.C. and the more recent comprising the last fifteen centuries. The first part of the article deals with the problem of older contacts, the other with more recent times.

According to generally accepted hypotheses the home of the ancestors of the American Indians was Asia and they reached America by crossing the narrow and often frozen Bering Straits. As the icesheet retreated, different nomadic hunting tribes moved from Central Asia to the north, came to Bering Straits and having crossed over the ice reached the coast of Alaska. The migrations advancing in small groups embraced about the last 10 millenia B.C. Archeological findings in Alaska relating to the paleolithic relics in the Gobi desert tell their story. The newcomers from Asia advanced to the south by the Cordilleras valleys because the eastern plains of America were still covered by the icesheet. In the last millenia B.C. peoples coming from Asia occupied the whole of America to its eastern and southern extremities, and it was just then that conditions like the ones found by the whites in the XVI c. were brought to existence. These facts prove that the primitive peoples of America brought the languages which they had spoken earlier in Asia; it is not strange, then, if they are connected with those spoken there today. The connections may be due to the fact that some American and Asiatic languages belong to the same families or formerly

were members of the same Linguistic Areas. Both possibilities will be considered here separately.

It has often been suggested that certain groups of American languages belong to Asiatic linguistic families. Chr. R. Rask (1787–1832) wrote about the affinity between the Eskimo-Aleut of North America and Ural-Altaic languages. A. Sauvageot and P. Schmidt in the XX c. supported the suggestion. Na-Dene languages were supposed to be members of the Sino-Tibetan family and recently K. Bouda (1952) connected the Uto-Aztecan family with Chukchi belonging to the Paleo-Asiatic group. As all these hypotheses have never been proved we cannot positively say if languages on either side of Bering Straits continue the same parent language or not. There is no doubt that the Asiatic and American languages have developed independently and there is little probability of finding in them words and morphemes of common origin which might determine rigorous phonetic correspondences between the languages discussed here, and, in consequence, the phonetic laws governing them. Their origin from a common parent language may be sufficiently established only by the following type of correspondences: phone a in language A always corresponds in native words to phone b in language B. We have no proof like this as yet and it is doubtful if we shall ever get it. Such being the case the positive investigations of linguistic contacts between Asia and America have had to follow other ways.

Linguistic typology, establishing different types of languages, was initiated in the XIX c., and since has developed parallel to historical linguistics which studies the histories of separate families. As historical linguistics is based on the fact that morphemes and whole words are derived from common protoforms, which are established on the basis of correspondence of their phones according to general phonetic laws, so linguistic typology is based on similarities of the whole structural systems of compared languages. Typological investigations are based then not on historical identity of phones and morphemes of different languages but on identity of relations between phonemes within the phonological systems of the languages and between the morphemes within their morphologic systems. Historical linguistics confronts elements of a language: phones and morphemes, and linguistic typology contrasts relations between elements within different linguistic systems. Thus the old similarities between the Asiatic and American languages belong to the latter category. They are typologic similarities of structural language systems consisting in mutual relationship of phonemes within phonological systems and morphemes within morphological systems.

The similarities themselves do not prove any affinity between the Asiatic and American languages. On the other hand they are too numerous and too complex to be the result of parallel and independent development. Probably we are dealing with different language families whose parent languages once belonged to the same great Linguistic Area. It embraced parent languages of Caucasian Japhetic dialects, Paleo-Asiatic languages of East Siberia and the American languages of the Pacific Coast. Owing to long mutual contacts the phonologic, morphologic and syntactic systems of their parent languages received similar structures which have been preserved till now by the languages derived from them. It may be supposed they existed several millenia B.C. in Central Asia. Ethnic shiftings separated the languages—members of the Convergence Area—and pushed them to the opposite extremities of Asia and even beyond its boundaries to America. However, we may find traces of old contacts in the similarity of their linguistic structures.

Structural similarities between the Caucasian Japhetic and Paleo-Asiatic languages

and those of the western and northern parts of America appear distinctly within their phonological, morphological and syntactic systems. All these problems were roughly outlined by J. F. Jakovlev in his article "Drevnie svjazi jazykov Kavkaza, Azii i Ameriki" Trudy Instituta Etnografii imenii N. N. Mikljucho-Makljaja. Novaja Seria II. p. 196–204 Akademija Nauk USSR 1947. Structural similarities within the phonological systems were discussed more extensively by T. Milewski in his article "Comparaison des systemes phonologiques des langues caucasiennes et americaines". Lingua Posnaniensis V (1955) p. 136–165. A. Trubetzkoy worked out phonologic systems of a part of the Caucasian languages in the article "Die Konsonantsysteme der ostkaukasischen Sprachen" *Caucasica* 8 (1931) p. 1–52. C. F. Voegelin analyzed phonologic systems of a part of American Indian languages in his article "Inductively Arrived at Models for Cross-Genetic Comparisons of American Indian Languages", University of California Publications in Linguistics 10 (1954) p. 27–45. It is my aim to draw conclusions from all the articles referred to.

From the Caucasian Japhetic languages we shall consider: from the K'art'velian family: Georgian; from the North-Eastern Caucasian family of Daghestan: Avar, Andi, /Qapuci/; from the languages spoken on the banks of the river Samur: Küri, Tabasaran, Aghul, Rutul, as well as Chechen, Dargva, Lak, and Artshi; from the North-West Caucasian family: Ubyk; and from Circassian-Quabardi family: Quabardi, Old Abzach, New Abzach, Termigoi, Bjeduhw /Bžeduhw/, Shapsug /Syap'sag/. These Caucasian languages I compared with twelve languages spoken in North America either on the Pacific Coast or not far from it between 60° and 40° north latitude, beginning at the north with Tlingit, Haida, Tsimshian, Nass, Kwakiutl, Quileute, Coeur d'Alene, Hupa, Siuslaw, Coos, Chinook and Lutuami. I consider also two languages of South America, Quechua and Aymará, originally spoken in the Andes Mountains north and south from Lake Titicaca.

The Caucasian and American languages referred to belong to consonant types. Their phonologic feature is the distinct preponderance of non-nasal consonants (over 70% of all the phonemes), while the number of nasal consonants and vowels is very low (lower than 30%). In spite of this common feature there are also some differences. Both language families, Asiatic and American are eminently consonantal, but generally Caucasian languages represent a more extreme form of the type. In the Caucasian languages discussed the number of non-nasal consonants varies from 26 to 66, that is 78.7% – 92.9% of the phonemes of their systems, and the American languages have between 20 and 43 non-nasal consonants i.e. 70.5% – 87.2% of the phonemes of the system. If on the one hand we disregard the South American language family (Quechua, Aymara) with a specially low percentage of non-nasals (70.5% – 71.4%) and on the other hand North-West Caucasian languages with a specially high percentage of non-nasals (84.5% – 92.9%), we shall be able to state that the percentage of the North American Indian languages mentioned here amounting to 74.1% – 87.2% (Tlingit) comes near to the relations in the South and North-East Caucasian languages where the percentage of non-nasals varies from 78.7% to 88%.

They are similar not just in their percentage of non-nasals but in the structure of their phonologic systems. The high percentage of non-nasals in Caucasian and American Indian languages is caused first of all by the richness of their stop systems. In the systems of all Caucasian languages presented here we distinguish at least seven types of closures: labio-plosive e.g. /p/; plosive-dental e.g. /t/; affricate-dental e.g. /c/; affricate-alveolar e.g. /č/; front-velar e.g. /k/; back-velar e.g. /q/; and glottal stop e.g. /ʔ/. Each of the seven closures

except the last one is the basis of pronunciation of three consonants differing from one another only by extended articulations, and the opposition of three sets of consonants is based on them. They are: voiced set /b, d, ʒ, ǯ, g, g·/ voiceless /p, t, c, č, k, ʔ/ and glottalized /p', t', c', č', k', q'/. What is typical here: the glottalized consonants are pronounced with closed glottis which shifting suddenly upwards and to the front pushes out the air and produces the phone.

The structure of stops of the American languages is completely parallel. They all take advantage of six or seven points of articulation as in the Caucasian languages and exhibit the consonant oppositions p : t : c /č/ : k : q : ʔ or p : t : c : č : k : q : ʔ. The distinction between the front-dorsal k and back-dorsal q is very characteristic. Though seldom met in Old World languages it often occurs in American and Caucasian languages referred to. Moreover, in all these Caucasian and American languages there are three sets of consonants: voiced /b/, voiceless /p/ and glottalized /p'/, a feature seldom occurring in other languages. The most important difference between the confronted Caucasian and American languages lies in the fact that in the American languages analyzed here there are less palatal-affricates. In some of them we have at the same time affricates like c and č and in others there are dental-affricates as c or alveolar as č, while in all the Caucasian languages discussed both c and č appear at the same time. The difference is not an essential one because the mixing of sets c and č occurs secondarily in many languages.

Having contrasted the similarities and differences between the consonant systems of the stops of these Caucasian and American languages let us compare individually chosen pairs from the two groups. We shall begin with the most simple systems based on the oppositions discussed and found everywhere. As a representative within the American group we may take Lutuami, and Rutul as that of the Caucasian family.

Lutuami (North America)

b	d	—	g	—	—
p	t	č	k	q	ʔ
p'	t'	č'	k'	q'	—

Rutul (North-East Caucasus)

b	d	ʒ	ǯ	g	—	—
p	t	c	č	k	q	ʔ
p'	t'	c'	č'	k'	q'	—

As in principle both systems are constructed on the ground of the same oppositions, so a certain number of the Lutuami phonemes correspond to Rutul phonemes and vice versa. By corresponding phonemes we understand those which though occurring in different languages occupy the same place in the phonologic system of each of them. As we see, 14 Lutuami stops find their correspondents in Rutul, but in the latter besides these 14 phonemes with correspondents in Lutuami there are four others without any correspondents. They are, ʒ, ǯ c, c'. Outside of this difference the systems are identical.

Another pair of similar and relatively simple stop consonant systems function in Quechua and Georgian.

Quechua (South America)

p	t	č	k	q	—
p^h	t^h	$č^h$	k^h	q^h	ʔ
p'	t'	č'	k'	q'	—

Georgian (South Caucasus)

b	d	ʒ	ǯ	g	—	—
p^h	t^h	c^h	$č^h$	k^h	—	ʔ
p'	t'	c'	č'	k'	q'	—

The difference between the two systems of the structure in principle identical, is restricted to the absence of dental-affricates in Quechua. Besides the second and the third sets are identical. The first set in both languages has no phonological characteristics, it is neither aspirated nor

glottalized and at the same time it is weak. The difference is only a phonetic one, Georgian having voiced stops and Quechua voiceless, but it does not injure the correspondence of the sets. In the two languages there are 14 corresponding phonemes while in Quechua 2 /q, q^h/ and in Georgian 3 /ʒ, c^h, c'/, phonemes have no correspondents in the other language. Outside of this difference both systems are parallel.

Now let us discuss more complex systems where besides the generally occurring oppositions there are still other phonological ones. More complex stop consonant systems take advantage of a lateral affricate closure L (voiced) Ł (voiceless) and Ł' (voiceless-glottalized), and they introduce new sets of consonants: strong p! t! etc., and strong glottalized p'! t'! etc. More extended stop consonant systems of the American languages take advantage of the two sets of affricates: dental c and alveolar č, as well as of the set of lateral affricates L Ł Ł' which are known in the Caucasian languages mentioned here. The existence of strong and strong glottalized consonants in the American languages is not attested, but in some languages of North America the opposition of sets k and q is extended to three sets front k', middle k and back q; the fact has no correspondence in the Caucasian languages. The structure of two complex systems of stop consonants in languages of two continents may furnish us an example of distinct similarity. Let us consider here Coeur d'Alene and Artshi.

Coeur d'Alene (North America)

b	d	—	ǯ	L	g^w	—	—
p	t	c	č	Ł	k^w	q	ʔ
p'	t'	c'	č'	Ł'	k'^w	q'	—

Artshi (North-East Caucasus)

b	d	ʒ	ǯ	L	g	—	—
p	t	c	č	—	k	q	ʔ
p'	t'	c'	č'	Ł'	k'	q'	—
p!	t!	—	č!	—	k!	—	—
—	—	c'!	č'!	—	—	q'!	—

The structure of the first three sets of consonants in both systems is almost identical. 20 phonemes in Coeur d'Alene have 19 correspondents in Artshi; only the voiceless affricate Ł has no correspondent. In Artshi of 20 phonemes contained in the sets only one ʒ is left without a correspondent. The last two sets of Artshi have no correspondents in Coeur d'Alene, but they are defective and embrace not more than 7 phonemes.

Let us confront now the most extended system of stop consonants in the Caucasian system of stop consonants in the Caucasian languages represented by Ubyk with the most extended American system in Coos.

Coos (North America)

b	d	—	ǯ	L	ǵ	g	g·	—
p	t	c	č	Ł	ǩ	k	q	ʔ
p'	t'	c'	č'	Ł'	ǩ'	k'	q'	—
—	t^h	—	—	—	—	k^h	—	—

Ubyk (North-West Caucasus)

b	x	d	ʒ	—	ǯ	ʒ́	—	g	g·	—
p	—	t	c	ç	č	c	Ł	—	q	ʔ
p'	π'	t'	c'	ç'	č'	c'	Ł'	k'	q'	—
p^h	$π^h$	t^h	—	—	—	—	—	—	q^h	—

The structure of both systems is strikingly similar. The first three sets form the base while the fourth one of aspirated consonants is in both systems strongly defective i.e. consisting of smaller number of consonants than the first three sets. In Coos 21 phonemes of 26 find correspondents in Ubyk, failing to do so, for the front dorsal consonant set ǵ ǩ ǩ' as well as for the affricate L and for k. In Ubyk 21 of 31 phonemes have correspondents in Coos. These are lacking only for labial affricates /β, π', $π^h$/, cerebral ç c' and palatal ʒ́ ć ć' and for ʒ p^h. Coos phone k^h corresponds to q^h in Ubyk; both are the only dorsal aspirated consonants.

The analyzed phonologic characteristics constituting elements of the languages discsssed here may form different combina-

tions. The following system is the most typical one:

b	d	ʒ	ǯ	L	g	g·	—
p	t	c	č	Ł	k	q	ʔ
p'	t'	c'	č'	Ł'	k'	q'	—

The nearest to this theoretical system of the Caucasian and American languages under discussion is that of Coeur d'Alene, the only difference being the absence of phonemes ʒ and g. Systems much like this typical one function in other languages discussed here.

The easiest explanation of similarities in the structure of the phonologic systems of these Caucasian and American languages is the hypothesis of the existence of a great Convergence Area in Central Asia for several millenia B.C. Languages—members of the Area—though belonging to different families, thanks to mutual contacts created phonologic, morphologic and syntactic systems much like one another. The essential features of these similar systems are preserved till now in spite of the fact that ethnic shiftings placed some languages in Caucasus and others on the Pacific Coast. The following arguments favor the hypothesis:

1. Outside of the correspondences discussed here the Caucasian Japhetic languages and the mass of American languages referred to—except perhaps of Penutian family in California—there are striking similarities in the structure of their morphologic and syntactic systems referred to in the article by J. F. Jakovlev already quoted. Three more recent works by T. Milewski: "La structure de la phrase dans les langue indigenes de l'Amerique du Nord", Lingua Posnaniensis II (1950) p. 162–207; "Typologia syntaktyczna języków amerykańskich" [Syntactic Typology of American Languages], Biuletyn Polskiego Towarzystwa Językoznawczego XII (1953), p. 1–24; "Odpowiedniki indoeuropejskich zdań złożonych" [Correspondents of Indoeuropean Compound Sentences], Biuletyn PTJ XVII (1954), p. 117–146, and an extensive article by Z. Gołąb "Problem podmiotu" [The Problem of Subject], Biuletyn PTJ XVII (1958) p. 19–66, confirm the existence of the similarities.

2. The distribution of the common structural phonologic, morphologic and syntactic features confirms our suggestions. It is true that some of them occur in other languages of the world but the whole set or a large part of it is only found in the Caucasian languages referred to and those of East Siberia, North America and the Andes, i.e. among others in the part of Asia nearest America and the part of America which is nearest Asia. It suggests the Asiatic origin of the structural features discussed. The great majority of South American languages, the Penutian family of California as well as the languages of the Atlantic Coast in North America belong to a completely different type. See T. Milewski "Phonological Typology of American Indian Languages" Lingua Posnaniensis IV (1953), p. 229–276. Those languages form the oldest linguistic layer of America and the newcomers from Asia similar to the Caucasian languages were piled one upon the other. That is why the languages with structural features analyzed here are found in areas situated nearer Bering Straits while those deprived of them are in more distant areas.

2. We shall discuss now other problems connected with the genesis of American cultures. They arose in the last centuries B.C. and had developed till the Spanish invasion in the XVI c. destroyed them. They flourished in the areas of today's Central and South Mexico, Central America, the Pacific Coast and the region of the Andes belonging now to Colombia, Ecuador, Peru and Bolivia. There is no doubt that their fundamental frame is of native origin, but ethnologists found so many similarities with the Asiatic cultures that more and

more is being said about foreign influences on their development. The cultural influences of India, Indochina, China and Oceania must be reckoned with, as the ships of that time were able to cross the ocean. P. River has often called attention to traces of those transoceanic contacts in American languages. We shall discuss here only one detail: similarities between the Sanskrit names used in India in the last centuries B.C. and the first fifteen centuries of our era and the structure of Aztec names from the valley of Mexico used between the XII and XVI centuries. The analysis may throw light on the high standard of Aztec culture destroyed by the Spaniards between 1519 and 1521.

As I have presented it in my treatise "La comparaison des systemes anthroponymiques azteques et indoeuropeens" Onomastica V/1 (1959), p. 119–176, Aztec and Sanskrit anthroponymic systems have a parallel structure. They are both mononominal and in both a unit is denoted precisely enough by only one name. In both languages the names are of three kinds: appellatives, compound names and shortened names.

Appellatives are common words used as names e.g. Azt. Xochi-tl *flower*, Miz-tli *puma*; Skr. Utpala- *lotos*, Mṛgendra- *lion*.

Appellatives form a commonplace type, they are the result of different associations. So the compound consisting of two or more words form the kernel of the traditional anthroponymic Aztec and Sanskrit systems. Types of names with the nominal compound structures are parallel in both languages. 1. Copulative compound names whose elements are equivalent e.g. Azt. Quauh-coa-tl *eagle and serpent* (*at the same time*); Skr. Gava-simha- *elephant and lion* (*at the same time*). 2. Determinative compounds where the first element determines the last one e.g. Azt. Itz-coa-tl *obsidian* /Itz-/ *serpent* /coa-tl/, Skr. Deva-hastin- *god's* /Deva-/ *elephant* /-hastin-/. 3. Possessive compounds —the owner of the second element is determined by the first one e.g. Azt. Vitzil-ivi-tzin *the one having a feather* /-ivi-tl-/ *of a humming bird* /Vitzil-/, Skr. Vṛka-ajina- *the one having the skin* /ajina-/ *of the wolf* /Vṛka-/; Azt. Chicome-coa-tl *the one having seven* /Chicome-/ *serpents* /-coa-tl/, Skr. Sapta-gu- *the one having seven* /Sapta-/ *head of cattle* /gu-/. 4. Compound names consisting of a preposition and a name e.g. Azt. Cen-iao-tl *together with* /Cen-/ *a warrior* /-iao-tl/ i.e. *with the god Tescatlipoca*, Skr. Saha-mitra *together with* /Saha-/ *god Mitra*. More important differences occur in the structure of names belonging to the verbal compound type where one element is a verbal root and has the meaning of third person. Both in Aztec and Sanskrit there are names consisting of two elements, the one a verb and the other an object. The verbal root usually is the last element. E.g. Azt. Xochi-pepe (*he who*) *plucks* /-pepe/ *flowers* /Xochi-/, Skr. Soma-dā- (*he who*) *some offers* /dā-/. There are names in reversed order, too, e.g. Azt. Tlama-ioca-tl (*he who*) *wins* /Tlama-/ *the booty* /ioca-tl/, Skr. Sadaśva- (*he who*) *mounts* /Sad-/ *a horse* /-aśva/. In Aztec there are verbal names consisting of three elements, so called sentence names completely unknown in Sanskrit e.g. Teo-yao-miqui *god* /Teo-/ *killed* /-miqui/ *a warrior* /-yao-/.

The third type are the names formed by the shortening of compound names e.g. Azt. Popoca-tzin from Chimal-popoca *the shield smokes* /popoca-/, Skr. Sena- from Bhīma-sena- *having a terrible army* /-sena-/.

Aztec and Sanskrit anthroponymic systems, though parallel, were doubtless created independently of each other, which is proved first of all by the Aztec sentence names which are completely unknown in Sanskrit. Great similarity of certain details in Sanskrit and Aztec suggests the possibility of influence. If the two countries were geographical neighbors you would doubtless say that Aztec names were modeled on Sanskrit names. The similar-

ities are the more striking because they are concerned in the first place with a closed sphere of cultural life, religion and the idea of power. We establish here elements which in both systems play the same part and are semantic correspondents.

Let us begin with the names whose last element has the meaning *god* and the first one describes the range of god's power. Functional correspondents between Aztec and Sanskrit are the words occurring in the final element: Azt. -teo-tl *god* Skr. -deva-h *god*. They may be not just semantic correspondents but phonologic, too. In Aztec there is no opposition between voiced and voiceless or aspirated consonants, so we have here one dental-stop t which functionally corresponds to Sanskrit t, th, d, dh. The following names are to be considered here Azt. Tlazol-teo-tl *deity of earth* /Tlazol-/, Skr. Pṛthvī-deva- *god of earth* /Pṛthvī-/; Azt. Cin-teo-tl *god of Indian corn* /Cin-/, Skr. Kusuma-deva- *god of blossom* /Kusuma-/; Azt. Heca-teo- *god of wind* /in doubly compound name Heca-teo-patil-tzin/, Skr. Apa-deva- *god of water*. As the matter of fact these names denote in the first place gods.

Names whose final element denotes a ruler and the initial one determines the sphere of his activity form a very numerous group. The final element of Aztec names of the type -tecoh-tli *master*, -teca-tl *man, master*, -ca-tl/ contracted form of -teca-tl/ corresponds functionally to the final element of Sanskrit names -rāja- *king*, -pati- *master*, -bhaṭa- *master*, -īśa- *master*, -svāmin- *ruler, master* and partly to -deva- *god*, too. As regards meaning we can confront Aztec names Tlal-tecoh-tli *master of the earth* /Tlal-/, Tlal-teca-tzin *master of the earth* with Sanskrit names Pṛthvī-īśa- *master of the earth* /Pṛthvī-/, Pṛthvī-rāja- *king of the earth*, Azt. Xiuh-tecoh-tli *master of turquoise, symbol of fire* /Xiuh-/ with Skr. Agni-deva- *god of fire*; Azt. Piltzin-tecoh-tli *master of children* /Piltzin-/ with Skr. Prajā-pati *master of descendants* /Prajā-/, Kumāra-svāmin *master of boys*; Azt. Tecuciz-teca-tl *master of big snail, symbol of the moon* /Tecuciz-/ with Skr. Candra-rāja- *king of the moon*; Azt. Yaca-tecoh-tli *master of the vanguard* with Skr. Sena-pati- *master of the army*; Azt. Total-teca-tl *master of turkeys* /Totol-/ with Skr. Aja-rāja- *master of goats* /Aja-/; Azt. Veve-teca-tl *master of drums* /Veve-/ with Skr. Ratha-rāja- *king of carts* /Ratha-/; Azt. Izqui-teca-tl *master of all people* with Skr. Viśva-nātha- *master of all people* /Viśva-/. Aztec names ending in -teca-tl and -ca-tl often have in the initial element the name of the place e.g. Chinan-teca-tl *master of the town Chinatlan*, Cuetlax-teca-tl *master of Cuetlaxtlan*, Tepoz-teca-tl *master of Tepoztlan*, Nonoal-ca-tl *master of Nonoalco*. Teocinio-ca-tl *master of Teociniocan*, Huexotzin-ca-tzin *master of Vexotzinco*. Their correspondents in Sanskrit are the names having in the initial element the name of town, country or tribe e.g. Madra-rāja- *king of Madra*, Sindhu-rāja- *king of the Ind*, Kalinga-rāja- *king of the Kalings*, Pulinda-bhaṭa- *master of Pulinda*, Vanga-pāla- *guardian of Vanga*, Śabara-svāmin- *master of Sabara*.

In Aztec names of divine couples the final element of god's name is -tecoh-tli *master* and of a goddess -cihua-tl *woman, mistress*. It corresponds to the Sanskrit forms -deva- *god*, -devī- *goddess*, e.g. Azt. Ome-tecoh-tli *master of two (worlds)*; Ome-cihua-tl *mistress of two (worlds)*, comp. Skr. Trai-lokya-rāja- *king of three* /Trai-/ *worlds* /-lokya-/, Tri-bhuvanapāla-deva- *god-protector of three worlds*, Trai-lokyadevī *goddess of three worlds*; Azt. To-naca-tecoh-tli *Our* /To-/ *Lord of Subsistence* /-naca-/; *To-naca-cihua-tli Our* /To-/ *Lady of Subsistence* /-naca-/; comp. Skr. Soma-deva- *god of soma*, Soma-devī- *goddess of soma*. Aztec names Mictlan-tecoh-tli *master of the country of death*, Mictlan-cihua-tl *mistress of the country of death* belong to the same type. We must emphasize that Aztec has no grammatical genders, so the opposition of

Sanskrit forms masculine -deva-, feminine -devī- could be rendered only by contrasting two different words: -tecoh-tli and -cihua-tl.

The final element of Aztec names -pil-li *dignitary's son /prince/* finds its semantic correspondent in Sanskrit final element of the similar meaning -kumāra-, e.g. Azt. Xochi-pil-li *son of flowers, prince of flowers* comp. Skr. Kuśa-kumāra- *son (prince) of plant* kuśa- /poa cynosuroïdes/; Azt. Nava-pil-li *son (prince) of magicians*, Skr. Condra-kumāra- *son (prince) of the moon.*

The Aztec name Cen-iao-tl *together with* /Cen-/ *the warrior* /iao-tl/ i.e. with the god Tescatlipoca is an exceptional form. Within the Aztec anthroponymy we failed to find any other compound name with preposition (here Cen *together with*) and noun as well as a name containing that of a god (here iao-tl *warrior*) the sobriquet of the god Tescatlipoca. It is the more interesting because this name has its correspondents on Sanskrit ground in the names of the type Saha-mitra- *together with* /Saha-/ *god Mitra*, Saha-deva- *together with god*, Sam-śravas *together with* /Sam-/ *fame* /-śravas/. The correspondents of Aztec preposition cen- *together with* are semantically and partly phonologically Sanskrit prepositions sam-, saha- *together with* followed by the god's name—in Aztec iao-tl in Sanskrit Mitra.

Animal gods play a very important part in Aztec and Sanskrit anthroponymy. The foremost place is taken by Aztec names including the word coa-tl *serpent.* Their correspondents in Sanskrit are names chiefly Buddhistic with nāgá-h *divine serpent* like Aztec coa-tl. Here are the most characteristic of this category of names: Azt. Mix-coa-tl *serpent of clouds* /Mix-/, comp. Skr. Deva-nāga- *god's serpent*; Azt. Citlal-coa-tl *serpent of stars* /Citlal-/, comp. Skr. Jaya-nāga- *serpent of victory* /Jaya-/. Azt. Oton-coa-tl *serpent of the Otomi /tribe/*; comp. Skr. Buddha-nāga- *Buddha's serpent*; Azt. Coa-naco[ch]-tzin *having earrings* /-nacoch/ *of serpents*; comp. Skr. Nāga-śarman- *having the protective cover* /śarman/ *made of serpents*; Azt. Coa-toma-tzin *having tomatoes* /-toma-/ *like serpents*, comp. Skr. Nāga-keśa- *having hair* /-keśa-/ *like serpents.*

Like *serpent* coa-tl, *eagle* Quauh-tli, the symbol of the sun, plays an important part in Aztec anthroponymia. Its functional Sanskrit correspondents are the names with the word sūrya- *the sun.* We can contrast Azt. Cuauh-tonal *having the glow* /-tonal/ *of the eagle* with Skr. Sūrya-tapas- *having the glow* /-tapas/ *of the sun*, and with Skr. sūrya-prabha- *having the brightness* /-prabha-/ *of the sun*; Azt. Cuauh-tex-petla-tzin *having the eagle's throne* /-petla-/ with Skr. Sūrya-dhvaja- *having the banner* /-dhvaja/ *of the sun* and with Skr. Sūrya-sena- *having the troops* /sena-/ *of the sun*; Azt. Cuauh-tl-ix *having the eagle's face* /ix/ with Skr. Sūrya-aksa- *having the eye* /-aksa/ *of the sun.*

Akin to names including the names of animals are those whose final element denotes the flower of a plant. Aztec names ending in -xochi-tl *flower*, e.g. Matlal-xochi-tl *flower of verdure* /Matlal-/, Elo-xochi-tl *flower of the stalks of Indian corn* /Elo-/, have their correspondents in Sanskrit names including in the final element the word -mañjarī- *bunch of flowers*, e.g. Sahakāra-mañjarī *bunch of mango* /Saha-kāra-/ *flowers*, Karpūra-mañjarī *bunch of camphor* /Karpura-/ *flowers.*

The material presented here proves beyond any doubt that Aztec and Sanskrit words of similar meaning occur in names of both languages expressing the same idea which creates an Aztec-Sanskrit semantic and sometimes phonologic correspondence, e.g. Azt. -teo-, Skr. -deva-; Azt. -cen (i.e. -sen), Skr. -sam-. The correspondence may be caused either by parallelism in the development of languages or by the influence of Indian culture crossing the Pacific. To solve this problem is impossible now and its future solution will depend upon the progress made in two spheres of investiga-

tion. The course of ethnologists' discussion on the problem of Asiatic-American cultural relations will be of vital importance. The question is if they will succeed in proving the existence of mutual influences between the two continents. The other very important sphere will be purely linguistic investigations, which will decide whether the similarities between the Aztec and Sanskrit anthroponymia are a trivial phenomenon often repeated in many languages or something exceptional. In the first case it could not contribute much to prove the existence of Asiatic influences in America, but in the latter case the strength of their evidence would be great. Now we can only say the structural and semantic Aztec-Sanskrit correspondences almost never occur in other Indoeuropean languages which may prove they are not a completely trivial phenomenon.

Even aside from the solution of this dilemma the similarities between the Aztec and Sanskrit anthroponymia are worth consideration. If it turns out there were no contacts between Asia and America it will prove some general regularities in the development of languages owing to which, in certain specified conditions, similar creations occur independently of each other. If the existence of contacts is ultimately proved, these similarities may contribute to determine the sphere and character of the transoceanic influences. In no case could they go so far as to restrict the originality of the New World cultures. Doubtless these cultures were brought into existence independently, thanks to the creative power of American peoples. Transoceanic influences might have reached the western coast of America in the form of outside impulses or fashions which transformed the development of native culture in a slight degree. They might have come from different Asiatic and Oceanian countries. The correspondence between Aztec and Asiatic anthroponymia seems to point to the fact that impulses coming from India and reaching Mexico were in the first place concerned with religious life. The frequent occurrence of the word denoting serpent links Aztec names with the names used by the Buddhists. It is hard to suppose the contacts were direct. It looks as if the religious ideas and names connected with them radiating from India eastwards in the first ten centuries of our era underwent many adaptations in Indochina and on the islands of Oceania before they reached Mexico.

RESPONSES TO LANGUAGE: JUDGMENTS OF GRAMMATICALNESS

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0. Introduction
1. Subjects
2. Materials
3. Procedure
4. Results
5. Discussion

0. This paper reports the first of a series of experimental studies of responses to language. We wish to investigate in some detail a fundamental assumption underlying the methods of linguistic analysis. This is the often implicit belief that native speakers of a language are able to make certain reliable and linguistically relevant decisions about their own language. It is essential that a linguist attempting to describe the structure of a language unknown to him be able to decide for any pair of utterances whether they are the 'same' or 'different.' The ultimate basis for such a decision is a judgment by a native speaker of the language in question. This is put explicitly by Harris:

> The use of instruments which permit exact measurement, as the ear does not, may enable us to employ tests of measured similarities (of sound waves or body motions) instead. But only those tests will be linguistically relevant which will accord with (even if they are not based on) the speakers' actions. This ultimate correlation is the only one which has so far been found to yield a simple language structure.[1]

The eliciting situation for a field linguist is quasi-experimental in that a careful investigator will make an effort to maintain standard conditions and to vary the linguistic stimulus material regularly so that the true judgments of his informants can be obtained. Harris describes the kind of procedure that might be used:

> A more exact test is possible when we wish to find out if two utterances are repetitions of each other, i.e. equivalent in all their segments (homonyms): e.g. *She's just fainting* as against *She's just feigning*. We ask two informants to say these to each other several times, telling one informant which to say (identifying it by some translation or otherwise) and seeing if the other can guess which he said. If the hearer guesses right about fifty percent of the time then there is no regular descriptive difference between the utterances; if he guesses right near one hundred percent, there is.[2]

Informant judgments, then, underlie a preliminary organization of linguistic raw data into 'same' and 'different' utterances.

The recent work of Chomsky has suggested that informant judgments are a significant factor at another point in linguistic analysis.

> The fundamental aim in the linguistic analysis of a language L is to separate the *grammatical* sequences which are the sentences of L from the *ungrammatical* sequences which are not sentences of L and to study the structure of the grammatical sequences. The grammar of L will thus be a device that generates all of the grammatical sequences of L and none of the ungrammatical ones. One way to test the adequacy of a grammar proposed for L is to determine whether or not the sentences that it generates are actually grammatical, i.e. acceptable to a native speaker, etc.[3]

We may thus observe that informant judgments operate at both ends of a linguistic analysis. They act as one basis for the discovery of structure, and they may also function in the evaluation of grammars. Such judgments are probably best regarded

[1] Z. S. Harris, Methods in Structural Linguistics, Chicago, 1951, fn. 7 p. 31.

[2] Z. S. Harris, *op. cit.*, p. 32.

[3] N. Chomsky, Syntactic Structures, The Hague, 1957, p. 13.

as outside of linguistic methodology, and it is therefore not surprising that linguists have given little attention to the factors upon which they are based. We seem to have a problem here that can most appropriately be attacked with the methods of experimental research. Our aim is to study informant reactions to linguistic stimuli under controlled conditions in both situations: 'same' or 'different' judgments of materials ranging from phonemes to sentences, and judgments of grammaticalness involving sentence-like utterances. The present study considers one approach to the latter problem. Native English speakers are asked to judge the grammaticalness of a series of utterances which vary from random sequences of words to standard English sentences. We hope that these studies will lead to a set of reliable procedures for obtaining and interpreting informant judgments in a way that is linguistically relevant.

Before turning to the details of the experimental design we should be more explicit concerning the precise aims of this study. As Chomsky uses the term, GRAMMATICAL is not to be equated to meaningful or semantically significant.[4] Nor is it to be identified with frequency of occurrence, since there are grammatical sentences that have very low probabilities of occurring, e.g. *Colorless green ideas sleep furiously.* In an effort to test these propositions our subjects were asked to make three judgments of the linguistic stimulus materials: 1. "Do these words form a GRAMMATICAL English sentence?"; 2. "Do these words form a MEANINGFUL English sentence?"; 3. "Do these words form an ORDINARY English sentence?" We mean by a GRAMMATICAL sentence the kind of sentence that should be produced by a generative grammar of spoken English and more specifically (following Bloomfield) as, "... an independent linguistic form, not included by virtue of any grammatical construction in any larger linguistic form."[5] We define a MEANINGFUL sentence as one whose meaning is clear by our own intuitions. We define an ORDINARY sentence as one which we believe occurs with relatively high frequency in English. Operationally, these definitions depend entirely on the authors' reactions rather than on any explicit mechanical procedure. We have classified a number of English word sequences on the basis of these definitions, and we then ask if English speakers will react to them as our a priori division would predict. If Chomsky is correct, the three judgments should be independent if subjects are presented with a wide range of linguistic stimuli.

1. 57 undergraduate students in beginning rhetoric clases at the University of Illinois served as subjects. All were native speakers of English. These subjects were by no means perfect analogues of the typical linguistic informant. The informants used in the field often acquire considerable linguistic sophistication and, in any case, become something more than naive native speakers of the language being described. It was felt that this study of linguistic judgments should rely on the reactions of persons without formal or informal training in structural linguistics. It is true, of course, that these subjects were by no means entirely naive concerning the structure of their own language, having been systematically exposed to the traditional view of English grammar during their years of schooling.

2. The linguistic stimuli consisted of 36 sequences of English words which are presented in Table 1. These were divided into six types (A, B, C, D, E, and F) each containing six sequences. Each type was classified as grammatical or not grammatical, meaningful or not meaningful, and ordinary

[4] N. Chomsky, *op. cit.*, p. 15–16.

[5] L. Bloomfield, Language, New York, 1933, p. 170.

TABLE I: Linguistic Materials

Type A: Not grammatical; not meaningful; not ordinary
1. A keeps changed very when.
2. Music some if shall odd.
3. Tables down cad ashes rock under off two syrup.
4. Ought cool send had, grand the respiratory.
5. Not off bandage to now lake asked so is were.
6. Label break to calmed about and.

Type B: Grammatical; not meaningful; not ordinary
1. Appointments can mow winters generously.
2. Extra rivers wished casually to cancel off.
3. Tired windmills hinge a lot of elephants.
4. What do recent stones invest?
5. Seventeen intuitions ate highly across the right.
6. During dishing, tolerant marbles remarked off.

Type C: Not grammatical; meaningful; not ordinary
1. Yesterday I the child a dog gave.
2. The with feet aching man came yesterday home.
3. Get me from the kitchen a big spoon.
4. You can him not understand.
5. Almost every Saturday she her house cleans.
6. To me was interesting the movie.

Type D: Not grammatical; meaningful; ordinary
1. Not if I have anything to do with it.
2. Probably, although he may surprise us.
3. About the time that the new models were shown.
4. Sometime early in the morning.
5. The kind of person who learns to talk with the natives.
6. In order to get there before they close.

Type E: Grammatical; meaningful; ordinary
1. I hope you don't mind me telling you.
2. Send one to Harry and I.
3. This had less pictures than the other.
4. It's better to walk than running.
5. He has one that he won't tell how much it cost.
6. Whom shall I say is calling?

Type F: Grammatical; meaningful; ordinary
1. I wish I could write to each of you individually.
2. The chairman's most important job is timing.
3. Numerous other countries will be represented.
4. They finished it yesterday.
5. He was ready to go.
6. Had the concert already begun?

(frequent) or not ordinary (rare) on the basis of the definitions of these terms presented above. The types are described in more detail below.

Type A: Not grammatical; not meaningful; not ordinary. The form of these sequences is much like that which would result from a process of random selection, i.e. Miller's procedures for obtaining the 'zero order of approximation of English.'[6] The sequences were, however, constructed artificially to meet the criterion that no three word combination would normally occur in English sentences of this length. Truly random selection was not used since this process could, however infrequently, result in a real English sentence.

Type B: Grammatical; not meaningful; not ordinary. These are grammatical but meaningless sentences of the kind described by Chomsky.[7] For these sequences the proper order of major form classes for English is maintained but the particular lexical items used do not normally occur in the order given.

Type C: Not grammatical; meaningful; not ordinary. These sequences are modeled on the examples of bilingual constructions provided by Weinreich.[8] In this type the order of words or phrases is to some extent non-English but the whole utterance has a clear meaning.

Type D: Not grammatical; meaningful; ordinary. These sequences would normally occur in English as responses to a previous question. We follow Fries in treating them as non-sentences (and therefore not 'grammatical English sentences') on the grounds that:

> The question itself, the preceding utterance that elicits the answer response, signals its structural meanings. For one who is listening in on a conversation it is necessary to hear the question itself

[6] G. A. Miller, Language and Communication, New York, 1951, p. 83–85.

[7] N. Chomsky, *op. cit.*, p. 15.

[8] Languages in Contact, Linguistic Circle of New York, 1953, p. 29–46.

if he is to understand the structural meanings in the answer.[9]

Our classification of these sequences is thus based on the fact that they are not grammatically independent, rather than on their other grammatical properties and their status as whole utterances—all of which a grammar might account for.

Type E: Grammatical; meaningful; ordinary. These sequences fail to satisfy traditional requirements for 'correct' English although they do have a clear meaning, occur frequently as independent utterances and must be accounted for by a grammar of spoken English. In E2, for example, *Send one to Harry and I*, the final word is an object of a preposition and should be *me* by traditional standards. This type was introduced to permit a comparison (involving Type F) between the linguistic and traditional notions of grammaticalness.

Type F: Grammatical; meaningful; ordinary. This provides the greatest possible contrast to the random sequences of Type A. Each sequence is presumably frequent, meaningful and grammatical by both linguistic and traditional criteria.

The types were equated in terms of the numbers of words and morphemes in each. For the purposes of this study all sequences within a type were treated as completely homogeneous, and the analysis of the data compared types rather than individual sequences.

3. The 36 sequences were tape recorded in random order with each item repeated once. Each sequence was read with a normal English sentence intonation.[10]

The 57 subjects performed in three groups: Group G (grammatical) where N = 21, Group M (meaningful) where N = 19, and Group O (ordinary) where N = 17.

[9] C. C. Fries, The Structure of English, New York, 1952, p. 172.

[10] We are indebted to David Reibel, who recorded the material and helped in its composition.

TABLE II: Results in Proportion of 'Yes' Responses

Sequences	Groups		
	Grammatical (N = 21)	Meaningful (N = 19)	Ordinary (N = 17)
A1	.143	.053	.000
A2	.000	.000	.000
A3	.000	.053	.000
A4	.048	.000	.000
A5	.095	.000	.000
A6	.143	.000	.000
Type A	.072	.018	.000
B1	.333	.105	.059
B2	.714	.105	.294
B3	.667	.105	.235
B4	.190	.053	.059
B5	.238	.000	.000
B6	.381	.053	.059
Type B	.421	.070	.118
C1	.429	.368	.118
C2	.190	.211	.118
C3	.238	.263	.000
C4	.333	.316	.000
C5	.190	.316	.000
C6	.190	.105	.000
Type C	.262	.263	.039
D1	.190	.263	.118
D2	.190	.526	.176
D2	.714	.842	.235
D4	.476	.526	.294
D5	.238	.579	.176
D6	.238	.421	.294
Type D	.341	.526	.216
E1	.429	.579	.471
E2	.571	.737	.588
E3	.762	.947	.588
E4	.286	.474	.235
E5	.857	.947	.647
E6	.048	.263	.000
Type E	.492	.658	.422
F1	.952	1.000	.882
F2	.905	1.000	.882
F3	1.000	.895	.941
F4	1.000	.947	1.000
F5	.952	.947	.882
F6	.952	1.000	.941
Type F	.960	.965	.922

Each subject was given an answer sheet numbered 1 to 36 with YES and NO following each number. Subjects in the G group were asked to answer the following question for each sequence as it was played twice: "Do these words form a grammatical English sentence?" The instructions for Group M were identical except that 'meaningful' was substituted for 'grammatical.' For Group O, 'ordinary' was substituted at this point in the instructions. The same tape was played for all three groups. Thus, the groups performed under the same conditions except that the specific judgment required differed in each case. We are therefore safe in assuming that any differences in performance are a result of differences in instruction and are not connected with variation in the stimulus material.

4. The results are presented in Tables II, III, and IV. We will first consider an over-all comparison of the three judgments and then examine each individually in terms of its relative and absolute power to discriminate.

We first ask whether the three judgments differ among themselves. Of the 18 possible comparisons in Table III, nine differ significantly at the .05 level of confidence or beyond. By chance we would expect less than one such difference in 18 comparisons so we may conclude that the judgments are largely independent of one another. Type B provides the crucial case. The preponderance of grammatical judgments over meaningful and ordinary ones for this type supports Chomsky's contention that non-occurring and meaningless sequences can be grammatical.

TABLE III: Significance of Differences Among Groups for each Type

Type	G/M	G/O	M/O
A	—	.05*	—
B	.01	.01	—
C	—	.01	.01
D	.05	—	.01
E	.05	—	.01
F	—	—	—

* Significance levels are based on chi-square tests using the tables in D. Mainland and I. M. Murray, Tables for use in Fourfold Contingency Tests, Science, 116.591–594, 1952.

TABLE IV: Ranking of Types by Proportion of 'Yes' Responses for each Group

Rank	Grammatical	Meaningful	Ordinary
1.	F (.960)*	F (.965)	F (.922)
2.	E (.492)	E (.658)	E (.422)
3.	B (.421)	D (.526)	D (.216)
4.	D (.341)	C (.263)	B (.118)
5.	C (.262)	B (.070)	C (.039)
6.	A (.072)	A (.018)	A (.000)

* Types above line for each group were classified in advance as grammatical, meaningful, and ordinary respectively.

We now examine the judgments separately and consider the ability of each to make relative and absolute discriminations among the different sequence types. Out of the 15 comparisons possible among the six types, 12 differ significantly for the G group and 13 for the M and O groups. The power of the judgments to distinguish among the types is thus extremely good.

Table IV gives the rankings of the sequence types in proportion of 'Yes' responses for each group. Types B, E, and F were defined in advance as grammatical and Types A, C, and D as not grammatical. The ranking of types in Table IV for the G group reflects this ordering. The mean proportion of 'yes' responses for the grammatical types is .624 and for not grammatical types is .229. The ranking of types for the other two judgments also follows the advance classification without exception. Since our main concern is with grammaticalness, we might ask whether the meaningful and

ordinary groups also ordered the types in accordance with the advance classification into grammatical and not grammatical. An examination of Table IV shows that the G group was the only one to produce an acceptable ranking. We conclude that the question, "Do these words form a grammatical English sentence?", produces responses which define a scale of grammaticalness which fits the advance classification of sequences into grammatical and not grammatical.

If we consider the absolute number of 'Yes' responses by the G group the results are less impressive. Only for Type F did more than half of the subjects respond with a judgment that the sequences were grammatical. If we use a sign test to determine whether or not subjects agreed on their judgments of a type we find that Type F was judged grammatical by a significant majority of the subjects, Types B and E are indeterminate (i.e. do not differ significantly from a 50/50 split), and Types D, C, and A are ungrammatical. Results are similar for the M and O groups. We see that the absolute judgments of subjects do not fit the advance classification of types particularly well for any of the experimental groups. Although the absolute judgments fail we have found that the three different judgments are independent and that the grammatical judgment provides the best relative ordering of types.

5. We may regard our a priori classification of the 36 sequences into six types as having defined a LINGUISTIC meaning for the terms GRAMMATICAL, MEANINGFUL and ORDINARY. The actual application of these terms to the sequences by subjects under controlled conditions is one way of defining the BEHAVIORAL meanings of these terms. The focus of our interest is on the term GRAMMATICAL, and we ask whether the behavioral meaning of this term corresponds to its linguistic meaning. In short, are linguistically grammatical sequences judged to be grammatical by naive native speakers unacquainted with linguistic theory? We find that subjects are able to rank a variety of word sequences in a linguistically relevant way. Judgments of grammaticalness define a scale which orders sequence types in a way that corresponds to the linguistic ordering. These judgments are, furthermore, independent of judgments as to how meaningful or ordinary the sequences are. This suggests that the linguistic and behavioral meanings of GRAMMATICAL are generally similar. However, a number of problems remain unsolved. The absolute degree of judged grammaticalness shows that an overlap of linguistic and behavioral meaning does occur but is not complete. For example, the impact of the traditional definition of this term is seen in the differential responses to Types E and F. Both are grammatical linguistically but only Type F meets the criteria of traditional 'correctness' and this type receives a significantly higher number of grammatical judgments from subjects.

We suggest as a general proposition that the linguistic definition of any term will never correspond perfectly with its behavioral definition, however obtained. Even if a theoretically perfect behavioral match could be developed, errors in measurement and the unreliability of human performance would prevent a perfect correlation in practice. This means that we will have to be content with a relative scale of behavioral response as one criterion for evaluating grammars. There is no obvious basis for dividing such a scale into discrete categories of grammatical and ungrammatical or into levels of grammaticalness. If this is the case, it follows that evaluation must involve a comparison of at least two grammars. It will never be possible to say that any single grammar is the best one for a language by the criterion of acceptability to native speakers.[11]

A behavioral evaluation of two gram-

[11] See Chomsky, op. cit., p. 51, where the possibility of determining the 'best' grammar is rejected on other grounds.

mars might take the following form:

Given two Grammars G_1 and G_2 of a Language L, we assume that if a grammar can generate grammatical sentences it can also determine for any sequence of words in L whether or not this sequence forms a grammatical sentence in L. We develop a number of sequences of words from L like those used in the present study ranging from randomly ordered words to sentences that occur frequently in L. We obtain for each sequence three scores:

(1) Whether it is judged to be grammatical or not grammatical by G_1.

(2) Whether it is judged to be grammatical or not grammatical by G_2.

(3) An acceptability score[12] which reflects an estimate of grammaticalness by a representative sample of native speakers of L.

We then ask which set of judgments (G_1 or G_2) fits the behavioral criterion of (3) best. A sample problem will illustrate this procedure.

Sequences	G_1	G_2	Acceptabi ty score
1	UG*	UG	5
2	UG	G	20
3	G	UG	80
4	G	G	100

* UG = ungrammatical; G = grammatical.

We see from these data that sequences judged grammatical by G_1 had a total acceptability score of 180, and the ungrammatical sequences for G_1, a score of 25. For G_2 grammatical sequences scored 120 in acceptability and ungrammatical sequences scored 85. We conclude that G_1 is the superior grammar in terms of acceptability to native speakers since the difference in acceptability scores between G_1 and G_2 is statistically significant.[13] We should note that the achievement of statistical significance is affected by the number and kind of sequences used in the comparison. A finer discrimination could be obtained by analyzing only the sequences where G_1 and G_2 disagree. Another kind of procedure would require G_1 and G_2 to generate a fairly large number of sentences and then compare the acceptability scores achieved by the spontaneous products of the two grammars. This more cumbersome method would have the advantage of eliminating the somewhat arbitrary sequence construction needed for the first procedure.

In this study, subjects were required to make absolute judgments of stimuli presented singly. If we must work with relative scales in any case, it might be more reasonable to ask for relative judgments, i.e. "Which of these two sequences is more grammatical?" This is a much less efficient approach in terms of the number of sequences that can be evaluated in a given time and should probably be avoided for this reason pending evidence showing that a more valid scale is obtained. It is possible that some more indirect approach will do a better job of approximating the linguistic meaning of this term. Chomsky has suggested ease of recall and tendency to be read with normal sentence intonation as probable characteristics of grammatical sentences.[14] It may be that some combination of behavioral measures will produce the best acceptability score. A general theoretical problem is how acceptability is to be weighted relative to other possible criteria for evaluating grammars, such as simplicity.

Our experiences in conducting this experiment make it clear that the study of native speaker responses to language is a complex research problem in its own right and not merely a question of casually submitting language materials to any handy informant. The fact that three out of 21

[12] We adopt this term from Z. Harris, Co-occurrence and Transformation, Language, 33.283–340, 1957, p. 293.

[13] This procedure would apply equally well to situations where the grammars involved are able to define more than two levels of grammaticalness or even to cases where a grammar is able to state the degree of grammaticalness of a sequence in a continuous sense.

[14] *Op. cit.*, p. 16.

subjects judged the sequence *Label break to calmed about and* to be grammatical indicates that very little can be assumed in advance about responses to language, and even the most obvious predictions need to be checked empirically. Judgments must be obtained under controlled conditions from a representative sample of naive native speakers of the language in question. The resulting data will require statistical description along with appropriate significance tests. Such an analysis provides, we believe, the only firm basis for decisions on the acceptability of linguistic forms by native speakers. We are not suggesting that statistics and controls can of themselves make this decision but only that the data needed for the external evaluation of grammars are likely to be ordered in a way that requires statistical treatment.

SENECA MORPHOLOGY IV: EXPANDED BASES*

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12. The nominalizer
13. The root suffixes
14. The incorporated noun root
15. The reflexive/reciprocal base

12.1. The position occupied by the verb or noun root in the structures described up to this point may also be filled by an expansion. The term EXPANDED BASE will be introduced here to cover such an expansion; i.e., a morpheme sequence substitutable for a root. The already described occurrences of simple verb and noun roots can be regarded as instances of irreducible bases. First to be described here is the one expanded noun base. The several expanded verb bases will be taken up in **13–15.**

12.2. The expanded noun base consists of a verb root followed by the NOMINALIZER morpheme -sh(æ)-/ˊsh(æ)-/-ʔsh(æ)-/ˊʔsh(æ)-:

Noun			
Pronominal Prefix	Noun Stem		
	Noun Base		Noun Suffix
	Verb Root	Nominalizer	

Examples are kaʔhásteshæʔ *power* (verb root -ʔhaste- *be powerful*), ʔothéʔshæʔ *meal, flour* (-théʔt- **[3.3]** *pound corn*), ʔoteɔnóshækɔ:h *in the shade* (-atéɔno- *be shady*).

12.3. The verb root occurs before the nominalizer in its most common basic allomorph or an automatic variant, although there are a few roots which occur here in their combining allomorph (**7.4**; see the second example below). The allomorphs of the nominalizer are conditioned by the verb root in an unpredictable fashion, but -sh(æ)- occurs with the largest number of roots. Examples of the four allomorphs are: -sh(æ)- in ʔotéɔno:shæʔ *shade, umbrella, parasol*, -ˊsh(æ)- in kaʔnikɔhtáshæʔ *thinking cap* (-ʔnikɔht- *be wise*), -ʔsh(æ)- in ʔakatokɛ:-ʔshæʔ *my ax* (-atokɛ- *be an ax*), -ˊʔsh(æ)- in ʔonowɛ́:ʔshæʔ *soap* (-nówææ- *wash*).

13.1. One expanded verb base involves the occurrence of one or more ROOT SUFFIXES after the verb root:

Modal Prefix	Verb			
	Pronominal Prefix	Verb Stem		
		Verb Base		Aspect Suffix
		Verb Root	Root Suffix	

These suffix morphemes can be ranked according to their relative closeness to the verb root when more than one occurs, the lower numbered rank occurring closer to the root. Those within the same rank (e.g. 1) are in contrastive distribution. Some ranks can be subdivided on the basis of their conditioning of aspect allomorphs; those within the same subdivision (e.g. 1a) condition the same aspect allomorphs. The ranking is as follows:

1a. Directive
1b. Causative III[1]
1c. Oppositive II

[1] The roman numerals provide an indication of the relative number of verb roots with which these morphemes have been found to occur, I occurring with the largest number.

* Seneca Morphology I, II, and III, IJAL 26.11–22, 123–129, 224–233.

2a. Causative II, Inchoative II
2b. Oppositive I
3. Causative I, Causative-Instrumental
4a. Inchoative I
4b. Inchoative III
5. Distributive
6. Instrumental
7. Dative
8a. Ambulative
8b. Transient

The allomorph of the root suffix itself, if it has several, is conditioned unpredictably by the preceding morpheme. These root suffixes will now be taken up individually.

13.2. The directive morpheme, -n-, occurs only with a few verb roots whose meanings involve motion, all of them ending in e, and is usually accompanied by either the cislocative or the translocative morpheme, neither of which has yet been described. It apparently indicates that the motion takes place in a specific direction. It conditions the aspect allomorphs -ɔh *descriptive*, -ɔ́s *iterative*, and -h *imperative*.[2] Examples are hewáktakhe:nɔ:h[3] *I've run there* (-takhe- *run*), he:enɔs *he goes there* (-e- *go, walk*), hɛ:ke:ʔ *I'll go there* (**3.10**).

13.3. The causative III morpheme, -hw-, also occurs with a very small number of verb roots, adding a causative meaning. It is preceded by the most common basic allomorph of the root, and conditions the following aspect allomorphs: -éh *descriptive*, -ás *iterative*, and -óh *imperative* (**3.12**). Examples are ʔakéɔthwɛh *I've poured it* (-ɛɔt- *pour*), ʔoʔkéɔthoʔ *I poured it*, hoʔwɛ:thwɛh *he's killed, massacred them* (-aʔwɛt- *die in quantity*).

13.4. The oppositive[4] III morpheme, ˊhs-, likewise occurs with only a few verb roots, the resulting meaning being in some sense the opposite of that of the root alone. However with a root that already denotes some kind of imbalance or undoing the oppositive indicates multiplication of this state or activity. It is preceded by the most common basic allomorph of the root, and conditions the following aspect allomorphs: -ɔh *descriptive*, -ɔ́s *iterative*, and -íh *imperative*. The following examples of the oppositive II contain also several expansions that have not yet been discussed: tewakɛ:hsowéhsɔ:h *I've uncovered my feet* (-owe- *cover*), ʔoʔthɛnɔhtíahsiʔ *they replaced* (*several things*) (-tía- *be unequal*).

13.5. The causative II morpheme, -t-/-at-/-æt-/-et-, and the inchoative II morpheme, ˊʔ-/ˊh-/-éʔ-/-éh-/ˊO-, occur with a somewhat larger number of verb roots than do the three morphemes already discussed. They indicate respectively causation and coming into being. They condition the following aspect allomorphs: -ɔ́h *descriptive*, -s *iterative* (**3.3, 3.6**), and -O *imperative*. Most roots which occur with these morphemes have their most common basic allomorphs and are followed by causative II -t- and inchoative II ˊʔ-/ˊh- (ˊʔ- before the descriptive aspect and ˊh- before any other): ʔonésto:tɔh *it has frozen it* (-nésto- *be frozen*), wa:tíashɛ:t *they called a council* (ˊ[h]áshɛ- *hold a council*); ʔakyéˊ:ʔɔh *I've gotten hurt* (-yɛɛ- *be hurt*), ʔoʔkye:ih *I fit into it* (-yei- *be fitting*). A few roots ending in e lack the e in this environment, and it is these roots which condition the causative II allomorphs -at-/-æt- (which one of the two being unpredictable), as well as the iterative II allomorphs -éʔ-/-éh- (-éʔ- before the descriptive, -éh- elsewhere): ʔakta:tɔh *I've put it in place* (-te- *be in place*), hasno:wæ:s *he's making speed, going fast* (-asnowe- *be fast*); ʔosnówɛʔɔh *it's gotten fast*, waʔósno:wɛh *it got fast*. The root -ahtety- *move, travel* conditions the causative II allomorph -et-:ʔɛyákohtɛ:tye:t *it will move her*. There are a few verb roots after which the allomorphic distribution differs uniquely from that described above. The root -skatkw- *laugh*, for example, not only conditions ir-

[2] The punctual allomorph can always be inferred from the imperative (**8.2**).

[3] The initial he-/h- of these examples belongs to the translocative morpheme.

[4] The cognate morpheme in Oneida is called by Lounsbury the INFECTIVE.

regularly the inchoative II allomorphs -ɛ́ʔ-/-ɛ́h- but also occurs with -ɛ́ʔ- (not -ɛ́h-) before the iterative morpheme: haska:-tkwɛʔs *he's laughing.*

13.6. The oppositive I morpheme, -kw-/-ɔ(:)kw-, has meanings like those of the oppositive II. It is preceded by the combining allomorph of the root, and conditions the following aspect allomorphs: -ɛ́h *descriptive*, -ás *iterative*, -óh *imperative*. The usual oppositive I allomorph is -kw-: sehotɔ:koh *open the door!* (-toɔ[:]- *close*). After a morpheme that conditions the descriptive allomorph -ɔh, however, the oppositive I is -ɔ(:)kw-:ʔoʔkékhahsɔ:koʔ *I separated several things* (-kháhs- *separate*). The oppositive I may also occur after the oppositive II, and has then the multiplicative meaning: ʔoʔtkɛʔnyowéhsɔ:koʔ *I uncovered my hands* (specifically both of them).

13.7. The causative I morpheme, ˂ʔt-/˂ht-/-t-/-ht-, and the causative-instrumental morpheme, ˂st-/-st-, occur with a large number of verb roots. The meaning of causative I is causative, and occasionally instrumental. The causative-instrumental morpheme has more often an instrumental meaning, but a causative meaning with some roots and an inchoative meaning with a few others. With the exception of the causative I allomorph -t-, these morphemes are preceded by the combining allomorph of the root. They condition the following aspect allomorphs: -óh *descriptive*, -há? *iterative*, -O *imperative*. There is no predictability as to which allomorph of either morpheme occurs with which verb root, but causative I -t-/-ht- and causative-instrumental -st- occur only with a very small number of roots. Examples of the causative I morpheme are: ˂ʔt- in kahtóʔtha? *I make it disappear* (-áhtɔ- *be lost*), ˂ht- in ʔakétkihtɔh *I've gotten it dirty* (-tki- *be dirty*), -t- in yɔwɔ:kɪha? *people use it for sifting, sifter* (-awak- *sift*), -ht- in hotiyɛʔkwáhsɔnye:htɔh *they* (*masc.*) *have made it savor the tobacco* (-hsɔnye- *savor*, with an incorporated noun root [**14**]). Examples of the causative-instrumental morpheme are ˂st- in ʔóɛʔhestha? *stopping place, station* (˂[h]ɛ́ʔhe- *stop*),[5] ʔɛkánɔʔnos (**3.4**) *it will get cold* (-nɔ́ʔno- *be cold*), -st- in waʔɔ́kwetɛ:-sthɛʔt *we* (*pl.*) *are pitiable* (-itɛ- *show pity*). The causative I morpheme may occur after the oppositive I, which then has the allomorph -kwa-:ʔakókwahtɔh *I've made it come out of the water* (-ɔ- *be in water*).

13.8. The inchoative I morpheme, ˂ʔ-/˂ʔhéʔ-/˂éʔ-/-héʔ-, like the inchoative II and III, indicates coming into being. The preceding morpheme occurs in its combining allomorph before ˂ʔ-, but in its most common basic allomorph before the other inchoative I allomorphs. The inchoative I conditions the following aspect allomorphs: -óh *descriptive*, -s *iterative*, -t *imperative*. Examples of its occurrence are ʔakóʔkta?ɔh *I've gotten to the end* (-óʔkt- *be at the end*), ʔoʔyɔ:sheʔt *it became long* (-ɔs- *be long*), wiyóʔheʔs *it becomes good* (-iyo- *be good*).

13.9. The inchoative III morpheme, ˂ʔ-, differs from the inchoative I only in conditioning the imperative (and punctual) allomorph -O rather than -t: ʔoʔwáhtɔʔ *it disappeared* (-áhtɔ- *be lost*).

13.10. The distributive morpheme, -hɔ-/˂ɔ-/˂:nɔ-/˂syɔ-/-nyɔ-/-ɔ-/-nɔ-/˂ʔhɔ-/˂hsɔ-/˂ʔsɔ-, indicates that several objects or several locations in space or time are involved in the meaning of the base: -hɔ- in háihsakhɔh *he's looking for several things, looking in several places, looking at various times.* The preceding morpheme occurs in its combining allomorph except before the distributive allomorph -hɔ- (see preceding example). The distributive conditions the following aspect allomorphs: ˂ʔ *descriptive*, ˂h *iterative*, -h *imperative*. Examples of the other distributive allomorphs are: ˂ɔ- in hatiyɛthwákwaɔh *they* (*masc. pl.*) *are harvesting things* (-yɛthw- *plant*, with oppositive I -kwa-), ˂:nɔ- in ʔoshéta:nɔʔ *they are numbered* (-áshet- *number*), ˂syɔ- in ʔóetkɛʔsyɔʔ

[5] Note the contrasting causative I ˂ht- in ʔaki:wáɛʔhehtɔh *I have decided*, lit. *made the matter stop.*

things have spoiled (ˊ[h]etkɛ- *be bad*, with inchoative I ˊ?-), -nyɔ- in kate:nyɔ? *things are in place* (-te- *be in place*), -ɔ- in kají:otɔ? *things are blocked up* (-jíot- *be blocked up*), -nɔ- in ha:wi:nɔh *he's carrying things* (ˊ[h]awi- *carry*), ˊ?hɔ- in hanéhkwi?həh *he's hauling things* (-néhkwi- *haul*), ˊhsɔ- in wáoshehsɔ:? *it chased him here and there* (-she- *chase*), ˊ?sɔ- in ?o?ká?se?sɔ:? *several animals hauled it* or *it hauled several things* (ˊ?se-). The allomorph -nyɔ- sometimes occurs after another distributive allomorph, yielding a double distributive: háihsakhɔ:-nyɔh *he's looking for several things, etc.* (cf. háihsakhɔh above).

13.11. The instrumental morpheme, ˊhkw-, has the meaning which its name implies: yeniyɔtáhkwa? *people use it for hanging, hanger* (-niyɔt- *hang*). The preceding morpheme occurs in its combining allomorph. The instrumental conditions the following aspect allomorphs: -ɔ́h *descriptive*, -á? *iterative*, -O *imperative* (**3.6**). Other examples are tyɔhéhkɔh *we (incl. pl.) use it for living, our sustenance* (-ɔhe- *be alive*), ?o?kó?ktak *I used it to end up with* (-ó?kt- *be at the end*).

13.12. The dative morpheme, -ni-/-i-/ˊ?se-/ˊhse-/-e- /-ɛ-/ˊ?s-/ˊás-/-hás-/ˊs-/-O-/-se-, indicates that the meaning of the base is for the benefit of or directed toward some person or thing: -ni- in hɔwɔ́tithæ:nih *she, they talk to them* (*masc.*). The preceding morpheme occurs in its combining allomorph except before the dative allomorph -hás-. The dative conditions the following aspect allomorphs: -h *descriptive*, ˊh *iterative*, ˊh *imperative*. The dative allomorphs -ni-/-i-/ˊ?se-/ˊhse-/-e- occur only before the descriptive and iterative morphemes: -ni- in hakhyatɔ:ni:h *he has written it for me* (ˊ[h/:]yatɔ- *write*), -i- in kóihsakih *it looks for it for her, monkey* (-[C]íhsak- *look for*), ˊ?se- in hakhní:nɔ?seh *he buys it for me* (ˊ[h/:]ninɔ- *buy*), ˊhse- in ?akɛ́ɔhse:h *I've said to it* (-ɛ- *say*), -e- in he:wa:hse:h *I've covered him with a blanket* (ˊ[h/:]wahs- *cover with a blanket*). The allomorphs -ɛ-/ˊ?s-/ˊás-/-hás-/ˊs-/-O- occur only before the imperative and punctual morphemes: -ɛ- in ?o?kóihsa:kɛ? *I looked for it for you*, ˊ?s- in wá:khni:nɔ?s *he bought it for me*, ˊás- (ˊɔ́s: by **3.14**) in wa:khatɔ́:s *he wrote it for me*, -hás- in ?ɛɔkɔehas *he will put it on it for them* (ˊ[h]e- *put on*), ˊs- in ?o?kéɔs *I said to it*, -O- in wáewa:s *I covered him with a blanket.* Dative -se- occurs before all four aspect allomorphs: kóæ?se:h *it has caught up with her* (ˊ[h]æ?- *catch up with*), ?ɛyakóæ?se? *it will catch up with her.*

13.13. The ambulative morpheme, ˊ:ne-, indicates that the meaning of the base involves walking: hatɔ́:ne? *he says it while walking* (-atɔ- *say*). The preceding morpheme occurs in its combining allomorph. The ambulative conditions the following aspect allomorphs: ˊ? *descriptive*, ˊ?s *iterative*, ˊh *imperative*. Other examples are honɔ:ktáni:-ne?s *he's sick but walking around*, (-nɔ́okt-*feel sick*, with dative -ni-), wá:kɛ:ne? *he saw it as he walked.*

13.14. The transient morpheme, ˊ?n-/ˊ:n-/ˊ?h-/ˊO-/-h-/-ɔ́-/ˊhs-/ˊsh-, indicates that the meaning of the base involves movement from one location to another: -h- in hóihsakɔ:h *he's gone looking for it.* The preceding morpheme occurs in its combining allomorph except before the transient allomorph -h-. The transient conditions the following aspect allomorphs: -oh *descriptive*, -é?s *iterative*, -áh (or occasionally -æh) *imperative*. Other examples are: ˊ?n-in ha:nekéæ?ne?s *he goes drinking* (ˊ[h/:]-neké[æ]- *drink*, ˊ:n- in hayé:nɔh *let him go and leave it!* (-yɛ- *leave*), ˊ?h- in hakáwe?he?s *he goes rowing* (-kawe- *row*), ˊO- in hohkí?-wa:ɔh *he has gone on the warpath* (-áhkí?w-*make war*), -ɔ́- in halɪtétyɔe?s *he goes traveling* (-ahtɛty- *travel*), ˊhs- in wa:yɛthwáhsa? *he went planting* (-yɛthw- *plant*), wa:yéihsæ? *he went and accomplished it* (-yei- *accomplish*), ˊsh- in ?ɛkatenɔ́?ɔshæ? *I'll go and watch over it* (-atenɔ?ɔ- *watch over*).

13.15. An additional aspect morpheme that occurs only after the transient morpheme is the PURPOSIVE. It indicates

purpose or intention, and occurs both with and without a modal prefix. It has only the shape -é?, and is preceded by the various transient allomorphs described in **13.14**: háihsakhe? *he came (or went) to look for it*, wáihsa:khe? *he intends to go and look for it*, ?éɔihsa:khe? *he'll come to look for it.*

14.1. A second expanded verb base consists of either a simple verb root or the expansion described in **13** preceded by an INCORPORATED NOUN ROOT:

	Verb			
Modal Prefix	Pronominal Prefix	Verb Stem		
		Verb Base		Aspect Suffix
		Noun Root	Verb Root (or Expansion)	

When the verb root has a transitive meaning, the noun root denotes its goal or, occasionally, its instrument: hayé?kɔthwas *he burns tobacco* (-yé?kw- [**3.12**] *tobacco*; -ɔthw- *burn*), ?akijakɔh *I'm eating fish* (-ij- *fish*; -k- *eat*), wá:?hnyayɛt *he hit it with a club* (-?hny- *club*; -yéht- *hit*). When the meaning of the verb root is intransitive, the noun root denotes either the performer or the thing described: kanáhtɛ?s *the leaf falls* (-náht- *leaf*; -ɛ- *fall*, with inchoative I -?-), wa?ɛ:no:t *the pole is standing upright* (-a?ɛn- *pole*; -ot- *stand upright*). If the verb root has an adjectival meaning and is followed by the iterative morpheme, the meaning of the noun root is pluralized: ka?háhtowa:nɛs *the logs are big* (-?háht- *log*; -owanɛ- *be big*).

14.2. The place of the noun root may be taken by the expanded noun base (nominalized verb root; **12**), as in the following examples: hoti?hastéshæyɛ? *they (masc.) have power* (-?haste- *be strong*, with nominalizer -sh[æ]-; -yɛ- *have*), wɛ:níshæte? *the day is present, today.* The nominalized constituent may also be an expanded verb base, rather than a simple root: kanɔhsakáyɔsyo:t *the old house is standing* (-nóhs- *house*, -akayɔ- *be old*, with nominalizer -sy- [**14.4**, **3.8**]; -ot- *stand upright*). Still more intricate sequences may result from the inclusion of root suffixes: ?o?kehotɔkwa?shékaha:tho? *I turned the key* (-ho- *door*, -tɔ- *close*, with oppositive I -kwa- and nominalizer -?sh[æ]-; -kahat- *turn*, with causative III -hw- [**3.12**]).

14.3. In most cases the incorporated noun root occurs in its combining allomorph before a consonant, its most common basic allomorph before a vowel (see examples above). There are some verb roots, however, which, although beginning with a consonant, are not preceded by the combining allomorph of the noun root: ?o?kyɔ:tya?k *I cut a tree* (-[y]ɔt- *tree*; -yá?k- *cut*), ?akáskwe:kɔh *I've closed my mouth* (-ask- *mouth*; -wek- *close*). There are other morphophonemic irregularities associated with particular combinations of roots; e.g., sometimes a noun root with final w has a supplementary i before a verb root with initial y: keskawi:-ya?s *I cut bushes* (-skaw- *bush*). A fairly large number of verb roots have a different, usually shorter, allomorph with an incorporated noun root than elsewhere: -ɛ- *fall* in kanáhtɛ?s *the leaf falls*, but -a?sɛ- in wa?sɛ?s *it fɔlls*; -nɔwɛ- *melt* in ?owisænɔ:-wɛ:h *the ice has melted*, but -nɔ?nɔwɛ- in ?onó?nɔwɛ:h *it has melted.*

14.4. Noun roots with combining allomorphs in æ or ɛ (**7.4**) are subject in some environments to alternations that require special mention. If the following verb root begins with the vowel a, this a is absent; i.e., it is replaced by the æ or ɛ: niyowe?-sá?a:h *small cover* (-awé?s[æ]- *cover*; -a?áa- *be small*). If the following verb root begins with y, the æ or ɛ is replaced by n: wa:-kanya?k *he broke off the story* (-ka[æ]- *story*). If the æ or ɛ is preceded by an obstruent or a basically strong vowel and the following verb root begins with o or ɔ, the æ or ɛ is replaced by y: kane:styo:t

standing board (-nest[æ]- *board*). If the æ or ɛ is preceded by a single basically weak a and the following verb root begins with o, the æ or ɛ is not present, but the preceding a is replaced by e: sekeoteh *tell a story!*. Under the same conditions, but before a verb root beginning with ɔ, the a is replaced by ɛ: sekɛɔteh *attach the inner bark!* (-ka[æ]- *inner bark*, homonymous with *story*). These alternations are found also, although the conditions arise more rarely, when verb roots in æ or ɛ are followed by root suffixes or aspect suffixes containing the stated initial phonemes.

14.5. A noun root whose most common basic allomorph ends in sh occurs with ts instead before a verb root beginning with i: wɛ:nítsi:yo:h *beautiful day* (-é:nish- *day*; -iyo- *be beautiful*).

15.1. A third expanded verb base consists of a verb root or the expansion described in **13** and/or **14** preceded by either the REFLEXIVE or the RECIPROCAL morpheme:

Modal Prefix	Verb			
	Pronominal Prefix	Verb Stem		
		Verb Base		Aspect Suffix
		Reflexive or Reciprocal Morpheme	Verb Root (or Expansion	

15.2. The reflexive morpheme, -at-/-ate-/-ah-/-a(C)-/-atɛ-/-(ɛ)-/-an-/-ɛn-/-ɛni-/-(ɛ)ɛ-, indicates that the total meaning of the base immediately involves or affects the person or thing denoted by the pronominal prefix, or the subject of a transitive prefix. Its meaning is roughly comparable to the 'middle voice' of some Indo-European languages: -at- in katɔ:ʔ *I'm mending it for myself* (-ɔɔ- *mend*), satyɛ:h *sit down!* (-yɛ- *set down*). With some verb roots, otherwise transitive in meaning, the resultant meaning is intransitive: ʔo?twato:-wɛ:ʔ[6] *it split* (-owɛ- *split*; cf. ʔo?tko:wɛ:ʔ *I split it*). With other verb roots the resultant meaning is specialized, at least from the point of view of the English translation: ʔotɔ:ni:h *it is growing* (-ɔ[:]ni- *make*).

15.3. The reciprocal morpheme, -atat-/-atate-/-atah-/-ata(C)-/-atatɛ-/-atan-, indicates that the total meaning of the base has as both its performer and its goal the person or thing denoted by the pronominal prefix. With some verb roots a further distinction is made as to whether the pronominal prefix refers to the same or different individuals. If the performer and goal are identical, the pronominal prefix is objective: -atat- in wa?akotati:yo? *she killed herself* (-iyo- *kill*). If the performer and goal are not identical, the pronominal prefix is subjective: wa?-ɔtati:yo? *she killed her*,[7] waɛnɔtáthyo:wi? *they (masc. pl.) told one another* (-[h]owi- *tell*). With other verb roots, however, a subjective prefix is used when the performer and goal are identical: ʔo?kátathe:ʔ *I cut myself* (-[h]en- *cut*; **3.10**).

15.4. With regard to their conditioning of the preceding pronominal prefix morphemes, the reflexive and reciprocal morphemes do not differ from verb or noun roots whose basic allomorphs begin with a, ɛ, or (ɛ); cf. **6**, **9–11**. The reflexive allomorphs occur as follows: -at- occurs before a verb root whose basic allomorph begins with a vowel, a single consonant other than t or n, or any of the alternations given special symbolization in **6.3** provided this alternation is not followed by n: see examples in **15.2** and ʔakátke:teh *I'm scratching myself* (-ket- *scratch*), kathwatases *I circle around it* (-[h/:]watase- *turn*); -ate- occurs before a verb root whose basic allomorph begins with two consonants or one consonant plus

[6] The first -t- belongs to the duplicative morpheme, described in a later chapter.

[7] An alternative way of expressing the meaning *she . . . her*, which is not covered by any transitive prefix (cf, **10.2**).

(C), but not before t, ʔn, or any alternation of **6.3**: ʔakátesyɔ:ni:h *I've prepared it for myself* (-syɔ[:]ni- *prepare*), ʔakáteʔho:ɔh *I'm covered* (-ʔho- *cover*); -ah-, -a(C)-, -atɛ-, and -(ɛ)- occur in an unpredictable fashion before verb roots whose basic allomorphs begin with t, n, ʔn, or an alternation of **6.3** followed by *n*, but -a(C)- occurs only before (h/:)n while -ah- never does, and -(ɛ)- has not been recorded before t: -ah- in ʔakáhtenyɔ:h *I've changed* (-teny- *change*), -a(C)- in tɔtakahnóʔne:tɛʔ[8] *I added something to what I had already done* (-[h/:]nóʔnet- *add one thing over another*), -atɛ- in ʔakátɛ:ni:nɔʔ *I've sold it* (-[h/:]ninɔ- *buy*), -(ɛ)- in ʔakɛno:wɛ:h *I'm a liar* (-nowɛ- *lie*). The allomorphs -an-/-ɛn-/-ɛni-/-(ɛ)ɛ- occur only before incorporated noun roots: -an- in wa:nyɛʔkwá:æʔt *he got himself into the snowdrift* (-yɛʔkwa[æ]- *smoke, snowdrift*), -ɛn- in wa:kɛni:jɔʔ *he gave me his fish* (-ij- *fish*), -ɛni- in hɛnisʔohtáehaʔ *he puts his hand on it* (-sʔóht- *hand*), -(ɛ)ɛ- in ʔakɛ:-hsíʔtyaʔkɔh *my foot's cut off* (-ahsíʔt- *foot*, with the initial a absent).

15.5. The reciprocal allomorphs occur as follows: -atat- occurs before a verb root whose basic allomorph begins with a vowel, a resonant other than n, or any of the alternations given special symbolization in **6.3** provided this alternation is not followed by n: see examples in **15.3**; -atate- occurs before a verb root whose basic allomorph begins with an obstruent, but not before t, ʔn, or any alternation of **6.3**:[9] waʔɔtate:kɛʔ *she saw her* (-kɛ- *see*), ʔakataténseʔs *I drag myself around* (-ʔse- *drag*); -atah-, -ata(C)-, and -atatɛ- occur unpredictably before verb roots whose basic allomorphs begin with t, n, ʔn, or an alternation of **6.3** followed by n but -ata(C)- occurs only before (h/:)n while -atah- never does: -atah- in yɔtahnóɔhkwaʔ *she loves her* (-noɔ́hkw- *love*); -atatɛ- in teonɔtátɛʔnya:ɛʔ *they (masc.) will look after themselves*, lit. *put in their hands* (-ʔny- *hand*); -atan- occurs before the verb roots -itɛ- *behave kindly toward* and -ɔkóht- *put through an opening*: ʔɛtwatani:tɛ:ʔ *we (incl. pl.) will have a bee*, lit. *behave kindly toward each other*, wa:yatanɔ:kot *they (masc. du.) had a ceremony*, lit. *put each other through an opening*.

15.6. A reflexive base may also occur with the nominalizer to form an expanded noun base (cf. **12.2**): ʔakáta?ti:shæʔ *my cane* (-aʔti- *lean*). A noun stem constructed in this way rarely occurs with an impersonal pronominal prefix. Instead there occurs an elliptical form with no pronominal prefix at all. The reflexive morpheme, being thus in initial position, has allomorphs beginning with ʔ: ʔatáʔtishæʔ *cane*.

[8] With the cislocative and duplicative prefixes, to be described.

[9] Note that the occurrence of -atat-/-atate- is not completely parallel to that of the reflexive allomorphs -at-/-ate-.

THE LINGUISTIC UNITY OF POCOMAM-POCOMCHI[1]

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0. Introduction
1. Chart of words with proto-Pocom reconstructions
2. Phonemic correspondences
3. Observations regarding relative distance and isogloss charts

0. The Pocom family of languages of Guatemala includes as its members Pocomam and Pocomchí. This paper seeks to confirm the close linguistic relationship of the members. Norman A. McQuown[2] in The Indigenous Languages of Latin America in 1955 considered this relationship to be that of two sub-languages equalling one language, i.e. Pocomam-Pocomchí equals Pocom. Otto Stoll[3] does not specifically state that the relationship between the members is as close as this, but he does consider that they derived from one basic Pocom stock, and are now to be considered as two language groups. It does appear therefore, that though very similar they are becoming two entities.

1. The author has done extensive field work in various dialects of the Pocomchí. When comparing the results of his findings with materials from the Pocomam, very impressive correlations between the two languages presented themselves.

However, to confirm the close relationship of these two languages, reference was made to a dialect survey, made by McQuown, of the four major dialects of Pocomam, as presented in the Linguistic Conference of Latin America held in Guatemala in 1949. To a chart of words taken from the four dialects of the Pocomam, were added the corresponding words from two dialects of the Pocomchí. Alternate recordings of forms have been noted from previous work done in the Pocomam area by Manuel Andrade. A comparative study of the sound correspondences was made, and an attempt at a statistical evaluation of the sound correspondences is now in process. This paper will present only the comparative material dealing with the Pocom problem. A later study will seek to evaluate the material on a statistical basis.

As a result of the comparison and statistical evaluation of the data, the following preliminary thesis was formulated: there is no greater divergence between the two so-called languages than between any two dialects of one.

The languages and dialects represented are divided into the general areas shown schematically on Chart 1. Abbreviations for the areas are as follows:

Pocomam:

M—Mixco
Ch—Chinautla
P—Palin
SL—San Luis Jilotopeque

Pocomchí:

T—Tamahú
SC—San Cristobal, Verapaz

There is one other major Pocomchí dialect area not considered in this study, i.e. Tactic-Purulha. Each dialect area in

[1] I am indebted to Robert Longacre for assistance in the preliminary stages of this study, and to Eric Hamp for his advice and aid in the later stages of refinement and presentation. N. A. McQuown most graciously offered me the use of M. Andrade's material on the Pocomam as well as his own field notes. The field work for the Pocomchí aspects of the study was undertaken between 1953 and 1957 in Guatemala under the auspices of the Summer Institute of Linguistics.

[2] American Anthropologist 57 (1955).

[3] Stoll, O., Die Maya—Sprachen der Pokom-Giuppe I (1888).

the study involves one major town, and the immediately surrounding area.

2.1.1. The consonant systems of Pocomchí and Pocomam are identical with the system of reconstructed Pocom.[4] For every reconstructed consonant, a series of phonemically identical correspondences can be tabulated so that Proto-Pocom *p has as reflexes p > p > p > p > p > p in the dialects here considered. Proto-Pocom *t has reflexes t > t > t > t > t > t.

We therefore set up the following Proto-Pocom consonants as a minimum list of consonants: p, t, k, ķ, ', b', t', k', ķ', ts,[5] ch, ts', ch', j, h, s, x, m, n, l, r, w, and y.

2.1.2. Consonant occurrence:

*p *pat—P, C, M, SL, T, SC: pat *house*, *si·p—P, Ch, M: sip; SL, T, SC: si·p *tick*.

*t *tilul—P, M, T: tulul; C: tilol; SL, SC: tilul *banana*, *hat—P, Ch, M, SL, T, SC: hat *you*.

*k *kinaķ'—P, C, M, SL, T, SC: kinaķ', *bean*, *'i·k—P, Ch, M, SL, T, SC: 'i·k *chile*.

*ķ *-tuķ—P, Ch, M, SL, T, SC: -tuķ *leg*.

*' *'o·j—P, Ch, M, SL, T, SC: 'oej *avocado*; *chye'—P, Ch, T, SC: che'; M, SL: chye' *tree*.

*b'[6] *b'yeh—P, Ch, T, SC: b'eh; M: b'e'eh; SL: b'yeh *road*; *sib'—P, Ch, M, SL, T, SC: sib' *smoke*.

*k' *k'way—P, Ch, M, T, SC: k'oy; SL: k'way *monkey*; *-sik'—P, Ch, M, SL, T, SC: -sik' *to look for*.

*ch *chye'—P, Ch, T, SC: che'; M, SL: chye' *tree*; *naķ' -wach—P, Ch, M, SL, T, SC: naķ' -wach *eye*.

*ts' *ts'i'—P, Ch, M, SL: ts'e'; T, SC: ts'i' *dog*; *-uhts'—P, Ch, M, SL; -uhts'; T, SC: -uts' *to smell*.

*ch' *ch'wa—P, Ch: ch'o; T, SC: ch'o·; M: ch'o'o; SL: ch'wa *rat*.

*j *ju·j—P, Ch, M, SC, T, SL: ju·j *paper*.

*h *ha·b'—P, Ch, M, SL, T, SC: ha·b' *year*; *b'eh—P, Ch, T, SC: b'eh; M: b'e'eh; SL: b'yeh *road*.

*s *sib'—P, Ch, M, SL, T, SC: sib' *smoke*; *sas—P, Ch, M, SL, T, SC: sas *mess*.

*x *xwon—P, M, SL, T, SC: xun; Ch: xon *pot*; *ryax—P, Ch, M, SL, T: rax; SC: rex *green*.

*m *muy—P, Ch, M, SL, T, SC: muy *a fruit*; *nim—P, Ch, M, SL, T, SC: nim *large*.

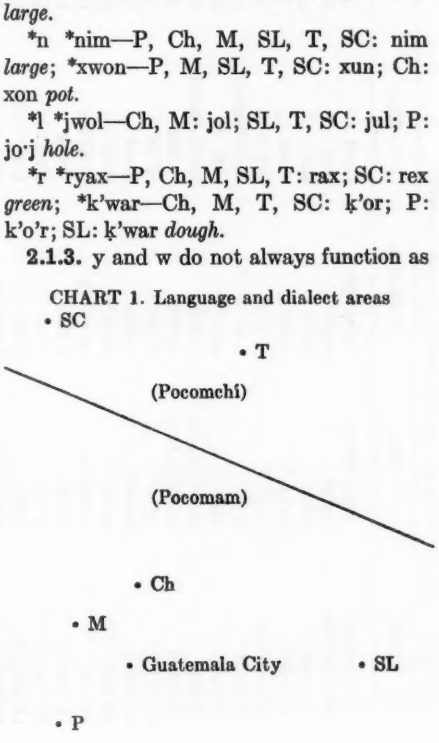
*n *nim—P, Ch, M, SL, T, SC: nim *large*; *xwon—P, M, SL, T, SC: xun; Ch: xon *pot*.

*l *jwol—Ch, M: jol; SL, T, SC: jul; P: jo·j *hole*.

*r *ryax—P, Ch, M, SL, T: rax; SC: rex *green*; *k'war—Ch, M, T, SC: ķ'or; P: k'o'r; SL: ķ'war *dough*.

2.1.3. y and w do not always function as

CHART 1. Language and dialect areas



[4] Certain consonant changes are evidenced throughout the data (1) due to loss of a phonetic unit ts > s, l > nothing; (2) due to choice of one unit of the phonetic sequence, 'b > ', h' > h/', y' > y/'; (3) due to morphemic change, aha > a. Other possible consonant correspondences are not considered in this material because of lack of data. These correspondences occur only once: m:j, b':l, h:j, t:t', l:j. A further study of these consonant correspondences must be made when more data are available.

[5] ts and t' do not occur in this limited corpus.

[6] b' though it has identical reflexes, varies in phonetic qualities between dialects. b' has a second set of correspondences which occurs in complementary distribution with the first: *b *b'u·ch—P, M, SL, SC: 'u·ch; T: b'u·ch; Ch: 'uch *dough*.

CHART 2. List of words with proto-Pocom reconstructions.

English	Palin	Chinautla	Mixco	San Luis	Tamahu	San Cristobal	Proto-Pocom
1. stomach	-pam/-pa·m	-pam/-pa·m	-pam	-pam	-pam	-pam	*-pam
2. ceiba tree	'inup	nup	nup	nup	(nok)	(nok)	*(nup)
3. smoke	sib'	sib'	sib'	sib'	sib'	sib'	*sib'
4. name	-b'eh	-b'eh	-b'eh	-b'eh/-b'ih	-b'ih	-b'ih	*b'yeh
5. avocado	'o·j	'o·j	'o·j	'o·j	'o·j	'o·j	*'o·j
6. road	b'eh	b'eh	b'e/b'e'eh	b'yeh	b'eh	b'eh	*b'eh
7. large	nim	nim	nim	nim	nim	nim	*nim
8. egg	moloj/maloj	maloj	moloj/maloj	maloj	miloj	miloj	*maloj
9. head	jolom/jalom	-jalom	-jolom	-jalwam	-na	-na	*jalwam
10. niece	-il'ib'	-il'ib'	-il'ib'	-il'ib'	-il'ib'	-il'ib'	*il'ib'
11. sister	-anab'	-anab'	-anab'	-anab'	-anab'	-anab'	*-anab'
12. bat	so·ts'	so·ts'	so·ts'	swa·ts'	ch'icohj	nich	*swa·ts'
13. air	te·w/tew	te·w/tew	te·w/tew	tyew	te·w/tew	te·w/tew	*tew
14. bean	kinaq'	kinaq'	kinaq'	kinaq'	kinaq'	kinaq'	*kinaq'
15. yellow	q'an	q'an	q'an	q'an	q'an	q'an	*q'an
16. perico	k'el	k'al	k'al	k'el	k'uyuch	k'uyuch	*k'wel
17. sun	q'ij	q'i·j	q'i·j	q'i·j	q'i·j	q'i·j	*q'i·j
18. banana fruit	tulul	tilul/tilol	tulul	tilul	tulul	tilul	*tilul
19. land	'ak'al	'ak'al	'ak'al	'ak'al	'ak'al	'ak'al	*'ak'al
20. heavy	'ahl	'ahl	'ahl	'ahl	'ahl	'ahl	*'ahl
21. green	rax	rax	rax	rax	rax	rex	*ryax
22. teeth	ha'wa'/weh	(r)e'eh	(r)eh	(r)yeh	(r)eh	(r)eh	*-eh
23. today	ro'nah	turu'	ture'/ru'na'	ture'	yu'nak	yo'na	
24. corn-dough	q'o'r/q'or	q'or	q'or	q'war	q'or	q'or	*q'war
25. dog	ts'e'	ts'e'	ts'e'	ts'e'	ts'i'	ts'i'	*ts'i'
26. salt	'ats'am	'ats'am	'ats'am	'ats'am	'ats'am	'ats'am	*'ats'am
27. fly	'uts'	'ots'/'uts'	'ots'/'uts'	'uts'	'uts'	'uts'	*'uts'
28. tick	sip	sip	sip	si·p	si·p	si·p	*si·p
29. mess	sas	sas	sas	sas	sas	sas	*sas
30. ant	sinik	sinik	sinik	sinik	sinik	sinik	*sinik
31. mouth	-chi'	-chi'	-chi'	-chi'	-chi'	-chi'	*-chi'
32. flower	'ihts'ub'	'ihts'ub'	'ihts'ub'	pichi'/h	'uhts'ub'	'ihts'ub'	*'ihts'ub'
33. eye	naq'-wach	naq'-wach	naq'-wach	naq'-wach nak'ach	naq'-wach	naq'-wach	*naq'-wach
34. rat	ch'o/ch'oh	ch'o/ch'oh	ch'o'o/ch'o'oh	ch'wa/ch'wah	ch'o	ch'o	*ch'wa
35. frog	xpeq	toch	tikoy'	xyech'	tiko'y	tiko'y	
36. star	ch'imil/ch'umil	ch'imil/ch'umil	ch'imil/ch'umil	ch'imin	ch'umil	ch'imil	*ch'umil
37. mosquito	xanan	(sancudo)	(sancudo)	'uch'a'	'uch'a'	'uch'a'	

35. frog	xpeḳ	toch	tikoy'	xyech'	tiko'y	tiko'y	
36. star	ch'imil/ch'umil	ch'imil/ch'umil	ch'imil/ch'umil	ch'imin	ch'umil	ch'imil	*ch'umil

37. mosquito	xanan	(sancudo)	(sancudo)	'uch'a'	'uch'a'	'uch'a'	
38. yesterday	'e·w	'e·w	y'e·w	y'e·w	'e·w	'e·w	*y'e·w
39. pot	xun	xon	xun/xon	xun	xun	xun	*xwon
40. woman	'ixoḳ	'ixaḳ/'ixoḳ	'ixoḳ	'ixoḳ	'ixoḳ	'ixoḳ	*'ixoḳ
41. needle	akuxah	akuxah	akuxah	akuxah	kuxa	kuxa	
42. pants	-kalson	we·x	we·x	wye·x	we·x	we·x	*wye·x
43. tacuacine	tukxa	tokx	tukx	tukx	tuxk	tuxk	*(twakx)
44. hill	yu·ḳ'	yu·ḳ'	yu·ḳ'	yu·ḳ'	yu·ḳ'	yu·ḳ'	*yu·ḳ'
45. grandmother	-no·yah	-no·yah	-ate't	-yab	-k'en	-atit	
46. fruit	muy	muy	muy	muy	muy	muy	*muy
47. tobacco	tabaco	tabaco	tabaco	mahy			
48. monkey	k'oy	k'oy	k'oy	k'way	k'oy	k'oy	*k'way
49. mule	wo·yax	bueyes	bueyes	woyex	boyex	boyex	*woyex
50. tree	che'	che'	chye'	chye'	che'	che'	*chye'
51. ear	xikin	xiken	xiken	xikin	xikin	xikin	*xikin
52. tooth	-ka'	-ka'	-ka'	-ka'	-ka'	-ka'	*-ka'
53. chile	'i·k	'i·k	'i·k	'i·k	'i·k	'i·k	*'i·k
54. lion	koj	leon	leon	koj	leon	leon	
55. turtle	kok	tortuga	tortuga	kok	kok	kok	*kok
56. nail	-ixk'yaḳ	-ixk'aḳ	-ixk'aḳ	-ixk'aḳ	-ixk'aḳ	-ixk'aḳ	*'ixk'yaḳ
57. blood	kik'	kik'/kyek'	kek'/kik'	kik'	kik'	kik'	*kyek'
58. to smell	-uhts'-	-uhts'-	-uhts'-	-uhts'-	-uts'-	-uts'-	*-uhts'-
59. he drinks it	-uk'-	-uk'-	-uk'-	-uk'-	-uk'-	-uk'-	*-uk'-
60. because of	-u'u·m	-u'u·m	-u'u·m	-u'u·m	-u'um	-u'um	*-u'u·m
61. hook	ga·nch	ch'it	ganch	gancuh	ganch	ganch	
62. leg	-tu·ḳ	-tu·ḳ	-tu·ḳ	-tu·ḳ	-tu·ḳ	-tu·ḳ	*-tu·ḳ
63. wife	-ixḳel	-ixḳel	-ixḳel	-ixḳel	-ehk'en	-ehk'en	
64. pig	'a·ḳ	'ahḳ	'ahḳ	'ahḳ	'ahḳ	'ahḳ	*'ahḳ
65. us	ḳoj	ḳej	ḳej	ḳoj	ḳoj	ḳoj	*ḳyoj
66. gnat	k'yaḳ	k'aḳ	k'aḳ	k'aḳ	k'aḳ	k'aḳ	*k'yaḳ
67. clean	saḳ	(jasḳ'ej)	(josḳ'ewib')	saḳ	saḳ	saḳ	*saḳ
68. red	kyaḳ	kaḳ	kaḳ	kaḳ	kaḳ	kaḳ	*kyaḳ
69. fire	ḳ'a·ḳ'	ḳ'a·ḳ'	ḳ'a·ḳ'	ḳ'a·ḳ'	ḳ'a·ḳ'	ḳ'a·ḳ'	*ḳ'a·ḳ'
70. black	k'ox	xul	xul	ḳ'eḳ	ḳ'eḳ	ḳ'eḳ	
71. snake	'a·ḳ'	'a·ḳ'	'a·ḳ'	'a·ḳ'	'a·ḳ'	'a·ḳ'	*'a·ḳ'
72. daughter	-aḳ'un	-ixḳ'un	-aḳ'un	-ixḳ'un	-ixḳ'un	-ixḳ'un	*-ḳ'un
73. hole	jo·j/jul	jol	jol	jul	jul	jul	*jwol
74. nose	-jo'	-jo'	-sahm	chi'joh	-ju'	-ju'	*jwo'
75. pitch pine	chaj	chaj	chaj	chaj	chaj	chaj	*chaj

CHART 2. *Continued*

English	Palin	Chinautla	Mixco	San Luis	Tamahu	San Cristobal	Proto-Pocom
76. roasting ear	aj	ajn	ajb'	ajb'	kuxuj	kuxuj	
77. gourd	jo·m	saḳahm	saḳohm	jojp	johm	johm	*saḳ john
78. paper	ju·j	ju·j	ju·j	ju·j	ju·j	ju·j	*ju·j
79. nigua	une·ch	uche·n	uche·n	caḳ'ahḳ	unech	unech	*une·ch
80. rain	jab'	jab'	jab'	jab'	jab'	jab'	*jab'
81. year	ha·b'	ha·b'	ha·b'	ha·b'	ha·b'	ha·b'	*ha·b'
82. hoe	'kyaj	'ikyaj	'ikam/'ikaj	'ikej	'ikej	'ikej	*'ikyaj
83. below	'ik(y)am	'ikyam	'ikam	'ikem	pan yu·ḳ'	k'ixkab'	*ikyam
84. grandson	-ji'	-ji'	-ji'	-ji'	-ji'	-ji'	*-ji'
85. two times	ka'pach	ki'eb'	ki'epb'es	ka'pech	ka'pech	ka'pech	*ka'pwech
86. witchdoctor	'aj'i·ts	'aj'i·ts	'aj'i·ts	'aj'i·s	'aj war	'aj war	
87. whistle	xul	xulxol	'aj xub'	xu·'	xul	xul	*xwol
88. toad	putsin	putsin	pu·tsen	tikoy	tikoy	tikoy	
89. water	ha'	ha'	ha'	ha'/ja'	ha'	ha'	*ha'
90. shoulder	na -talab'	-talab'	-talab'	-taleb'	-teleb'	-teleb'	*-talyab'
91. vine	k'aha·m	k'aha·m	k'aha·m	k'aha·m	k'aham	k'aham	*k'aha·m
92. fox	pa·r/par	pahar	pahar	pahar	pahar	pahar	*pahar
93. comal	xo·t/xoht	xa't/xoht	xoht	xoht	xoht	xoht	*xoht
94. mat	pop/pohp	pahp/pohp	pohp	pahp/pohp	pohp	pohp	*pohp
95. tecomate	su'	so'	su'	su'	suh	suh	*suh'
96. fight	k'ah	pleito	k'ah	k'ah	pleito	k'ah	*(k'ah)
97. look for it	-sik'	-sik'-	-sik'-	-sik'	-sik'	-sik'	*-sik'
98. fish	kar	kar	kar	kar	kar	kar	*kar
99. you	hat	hat	hat	hat	hat	hat	*hat
100. moon	poh	pah/poh	poh	poh	poh	poh	*poh
101. flea	'uk'	'ok'/'uk'	'uk'	'uk'	'uk'	'uk'	*'uk'
102. jar	jo·m	jahm/john	john	ku'	johm	johm	*johm
103. bald	jo·m/jalom	ts'o·k'	sok'ihm	k'ux	t'us	t'us	
104. turkey	chumpihpe'	pe'y	chumpi·pah	pi·p	'ak'ach	'ak'ach	
105. ash	cha·j	cha·j	cha·j	sa'cha·j	cha·j	cha·j	*cha·j
106. house	pa·t	pa·t	pa·t	pa·t	pa·t	pa·t	*pa·t
107. dough	'u·ch	'uch	'u·ch	'u·ch	b'u·ch	'u·ch	*b'u·ch
108. jug	tana·xah	xu·t	tana·x	xu·t'	xu·t'	xu·t'	*(xu·t')
109. cloud	su·ts'	su·ts'	su·ts'	su·ts'	su·ts'	su·ts'	*su·ts'
110. drum	mo·rah	tambor	tambo·r	tambwa·r	tambor	tambor	*tambwa·r

consonants in consonantal position. y and w function as do the consonants when they occur as initial or final C in the basic Pocom shape of syllable CVC or as the initial C of CV patterns.

*w *tew—P, M: te·w; SL: tyew; T, SC: tew *air*. *y *yu·ḳ'—P, C, M, SL, T, SC: yu·ḳ' *hill*.

2.2. The vowels in Proto-Pocom occur either in a short form or in a lengthened form. The vowels are: i, i, u, e, a, o and i·, u·, e·, a·, o·.

2.2.1. The high, front and back short vowels remain unchanged in all the dialects.[7] *i: *nim—P, C, M, SL, T, SC: nim *large*. *u: *muy—P, C, M, SL, T, SC: muy *a fruit*.

The mid back short vowel occurs with one set of correspondences, except in unstressed position where the vowel is fronted in Ch, SL, T and SC. *o: *poh—P, Ch, M, SL, T, SC: poh *moon*; *-jalwaṁ—P, M: -jolom; Ch: -jalom; SL: jalwam *head*.

The mid, front, short vowel occurs with one set of correspondences. *e: *b'eh—P, Ch, T, SC: b'eh; M: b'e/b'e'eh; SL: b'yeh *road*.

The low, short, central vowel has one set of correspondences in stressed position and one set in unstressed position. *a: *sas—P, Ch, M, SL, T, SC: sas *mess*; *maloj—P, M: maloj/moloj; Ch, SL: maloj; T, SC: miloj *egg*.

The high, short, central vowel has two sets of correspondences in stressed position, and one set in unstressed position. *i: *ts'i'—P, Ch, M, SL: ts'e'; T, SC: ts'i' *dog*; *xikin—P, SL, T, SC: xikin; Ch, M: xiken *ear*; *tilul—P, M, T: tulul; Ch: tilol; SL, SC: tilul *banana*.

2.2.2. The high, front lengthened vowel occurs with three sets of reflexes. *i·: *'i·k—P, Ch, M, SL, T, SC: 'i·k *chile*; *ḳ'i·j—P: ḳ'ij; Ch, M, SL, T, SC: ḳ'i·j *sun*; *si·p—P, Ch, M: sip; SL, T, SC: si·p *tick*.

[7] Variant recordings for certain dialects give alternative sets of correspondences for the proto-vowels: e.g. *o *poh—P, M, SL, T, SC: poh; Ch: poh/pah *moon*.

The high, back lengthened vowel occurs with two sets of reflexes. *u·: *yu·ḳ'—P, Ch, M, SL, T, SC: yu·ḳ' *hill*; *b/u·ch—P, Ch, SC: 'uch; M, SL: 'u·ch; T: b'uch *corn dough*.

The low lengthened vowel remains unchanged throughout the dialects. *a·: *ḳ'a·ḳ'—P, Ch, M, SL, T, SC: ḳ'a·ḳ' *fire*.

The mid front lengthened vowel occurs with two sets of reflexes. *e·: *wye·x—Ch, M, T, SC: we·x; SL: wye·x *pants*; *tew—Ch, M, T, SC: te·w; SL: tyew *air*.

The mid back lengthened vowel occurs unchanged throughout the dialects. *o·: *'o·j—P, Ch, M, SL, T, SC: 'o·j *avocado*.

2.3.1. In certain of the dialects (M, P, Ch, SL), y and w occur not only as initial (or final) C in the basic Pocom syllable shape CVC, or as the initial C of CV syllable shapes, but also following consonants in these positions. It is therefore possible, in these dialects, for such syllable shapes as CyVC or CwVC to occur.

A number of possibilities might adequately explain the occurrence of these types of syllable shapes in certain of the dialects. We could consider that these dialects have retained the y and w in this position from the proto-language, and that the other dialects have failed to retain it.

We could also consider that by innovation, the dialects in which this particular syllable shape occurs, have added a sequence foreign to the proto-language.

Or we could consider that the y and w have replaced some feature of the proto-language, though we do find that the dialects having y or w occurring in this position, have this feature, which does not correlate with any feature in the other dialects.

Finally, we might consider that in the languages having y and w in this position, a feature has been added to some other feature occurring in the other languages. It would therefore be possible to consider that the y or w have been added to certain consonants in the proto-language, or that they

have been added to vowels in the proto-language.

It would appear that alternative one above would have certain validity, in that such sequences occur frequently in the languages having them at the present time. There is further, an indication that even the T and SC dialects once had these sequences, since an alternate pronunciation for the word *deer* gives [kyej]. However, our final decision must be based not so much on what happens in the daughter languages, whatever the frequency of occurrence of the feature under discussion, but rather on the basis of proto-distributions.

2.3.2. Whichever alternative is chosen then, we are involved in a decision as to the status of y and w. Are these phonemes consonants patterning by themselves? Or must labialization or palatalization be postulated? Or may a limited number of syllable nuclei be postulated involving the occurrence of y/w plus a vowel?

If y and w are interpreted as consonants patterning by themselves, we would need to postulate at least two new types of syllable shapes and also to establish at least one new distribution class of vowels, since only the vowels e and a occur following y and w. This interpretation would give us little or no help in hypothesizing proto-phonemes for such sets of correspondences as u > o > o > u > u > u.

If labialization and palatalization of consonants were postulated, a rather large inventory of phonemes would need to be postulated, with the possibility that more phonemes would need to be set up later. We still would have no simple solution to the irregular sets of correspondences which we find in the language.

For reasons of economy and simplicity, a limited inventory of complex syllable nuclei have been postulated, involving sequences of y/w plus a vowel. Not only is the potential inventory of phonemes greatly decreased, but also no new syllable shapes need be postulated with their accompanying distributional complexities. Finally, the irregu-

CHART 3. Percent of Shared Retentions

Swadesh list

	P	Ch	M	SL	T	SC
P		80	77	80	63	69
Ch	82		80	75	66	66
M	82	84		69	63	66
SL	83	78	77		69	69
T	77	77	76	70		83
SC	80	77	78	81	91	

Total list

CHART 4. Distance in Centuries

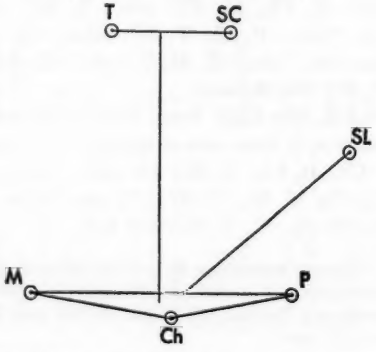
Swadesh list

	P	Ch	M	SL	T	SC
P		7	9	7	15	12
Ch	7		7	10	14	14
M	7	6		12	15	14
SL	6	8	9		12	12
T	9	9	9	11		6
SC	7	9	8	7	3	

Total list

CHART 5. Relative Distance by Time Depth

(Based on Swadesh 100 list)



Scale: ½ inch equals 100 years.

lar sets of correspondences find ready solution since the reflexes u > o > o > u > u > u would obviously lead to the hypothesis of *wo, with certain dialects selecting the high component as significant, and other dialects selecting the mid component as significant.

2.3.2.1. Clusters with y.

*ye *chye'—P, C, T, SC: che'; M, SL: chye' *tree.*

*ya *k'yaḳ—P: k'yaḳ; Ch, M, SL, T, SC: k'aḳ *gnat.*

*yo *ḳyoj—P, SL, T, SC: ḳoj; Ch, M: ḳej *us*

*ye· *wye·x—C, M, T, SC: we·x; SL: wye·x *pants.*

2.3.2.2. Clusters with w.

*we *k'wel—P, SL: k'el; Ch, M: k'al *perico.*

*wa *ḳ'war—P: ḳ'o'r/ḳ'or; Ch, M, T, SC: ḳ'or; SL: ḳ'war *corn dough.*

*wo *-jwo'—P, Ch: -jo'; T, SC: -ju'; SL: chi'joh *nose.*

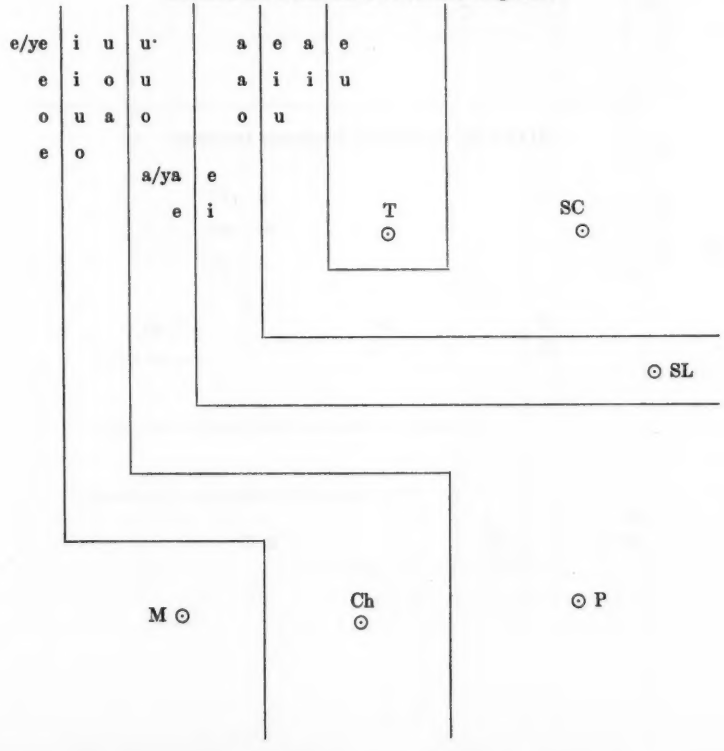
*wa· *swa·ts'—P, Ch, M: so·ts'; SL: swa·ts' *bat.*

3.1. The material used in this study involved 110 words. A preliminary same-difference percentage was first calculated. Results are presented in Chart 3, lower half. Time depth counts were made on the basis of 302 constant.[3] (See Chart 4, lower half.)

3.2. Of the 110 items listed, only 36 occur on Swadesh's 100 list. A new same-difference percentage figure was derived on the basis of these 36 items. Results are presented in Chart 3, upper half. It will be noted that the results of the calculations using the 36 items show a wider division between dialects of Pocomam and Pocomchí. However, in certain instances, as in comparing Mixco with San Luis, the distance between these two Pocomam dialects is almost as great as between Mixco and the Pocomchí

[3] Gudschinsky, S. C. The A B C's of Lexicostatistics, Word 12 (1956).

CHART 6a. Normalized Phonemic Isoglosses



dialects. A relative time depth count was also calculated using a 302 constant and the results of this count are presented on Chart 4, upper half.

3.3. From these time depth figures, a relative distance map (Chart 5) was made and this map served as a basis for isogloss distribution. A relative geographical distribution was maintained. The Pocomchí dialects, i.e., Tamahú and San Cristobal are more closely related than are any two other dialects. Of the four Pocomam dialects, San Luis is observed to be the most divergent.

3.4. No regular pattern of isogloss distribution can be derived from a study of the phonemic variations (Chart 6) or the lexical variations (Chart 7). Each dialect can stand by itself having a phonemic variation or lexical variation that diverges from all the

CHART 6b. Normalized Phonemic Isoglosses

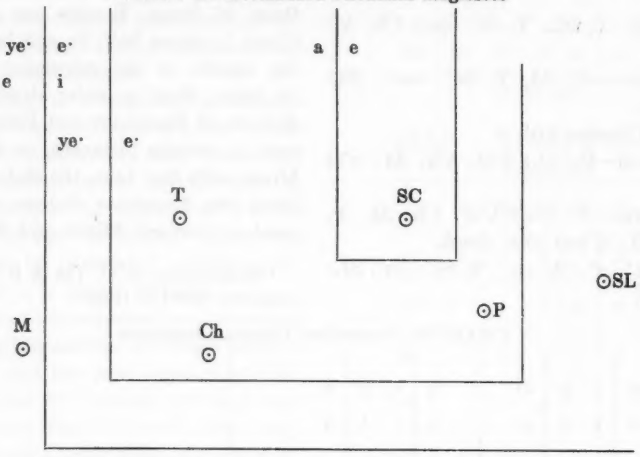
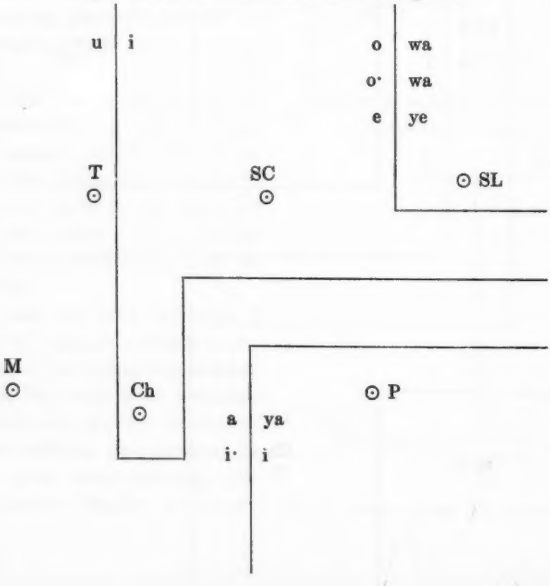


CHART 6c. Normalized Phonemic Isoglosses



other dialects. Each may pair with any other one or two dialects having shared phonemic variations or lexical variations that differ from the innovating dialects.

3.5. Evidence clearly supports a division between the Pocomchí dialects of Tamahú and San Cristobal and the Pocomam dialects of Mixco, Palin, Chinautla and San Luis: (1) A vowel change is noted in words 4, 25, 8, and 90, (2) the reversal of the final CC's is noted in word 43, (3) the consonant h does not occur in the Pocomchí dialects in word 58, (4) Pocomam vowels are long in words 60 and 91, whereas they are short in these words in Pocomchí, (5) the process of dissimilation has occurred in word 79, (6) a lexical change is noted between the languages in words 2, 9, 16, 63, 76, 86 and 103.

Charts 3, 4, and 5 indicate that the Tamahú dialect and the San Cristobal dialect are the most divergent, though the San Luis dialect is equally divergent from the other Pocomam dialects as it is from the Pocomchí dialects.

The isogloss charts 6 and 7 present a confusing picture, and so add nothing conclusive regarding the relationships of the six dialects. Each dialect can stand alone as divergent from any of the other dialects, or each can pair with any other dialect in opposition to the rest of the dialects. This pattern prevails for both the normalized

CHART 7a. Normalized Lexical Isoglosses

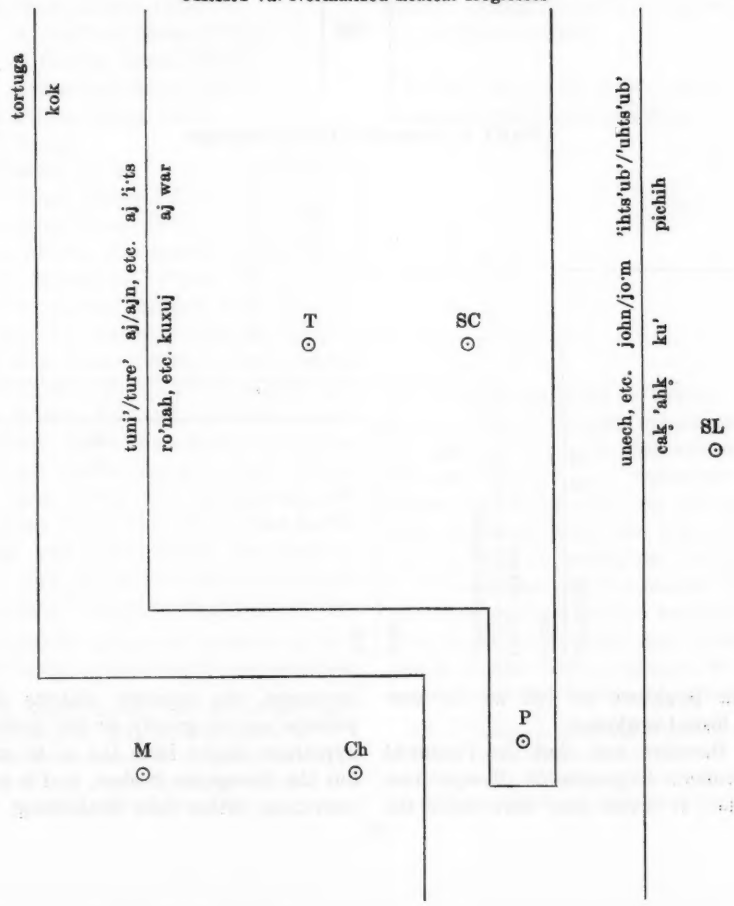


CHART 7b. Normalized Lexical Isoglosses

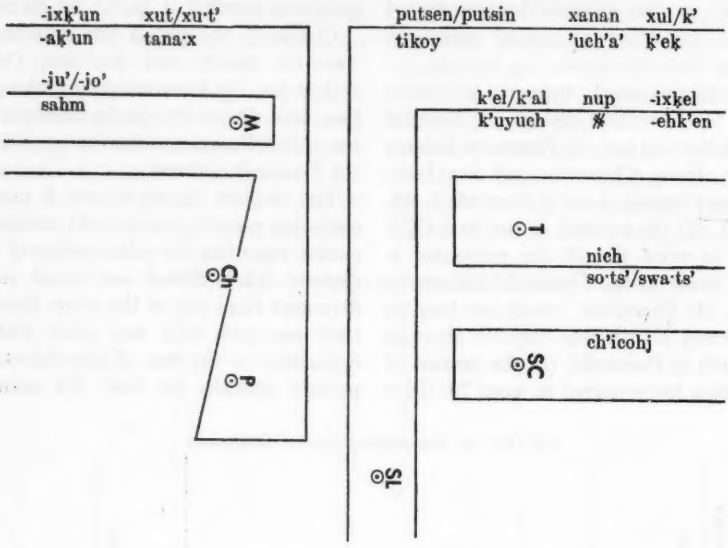
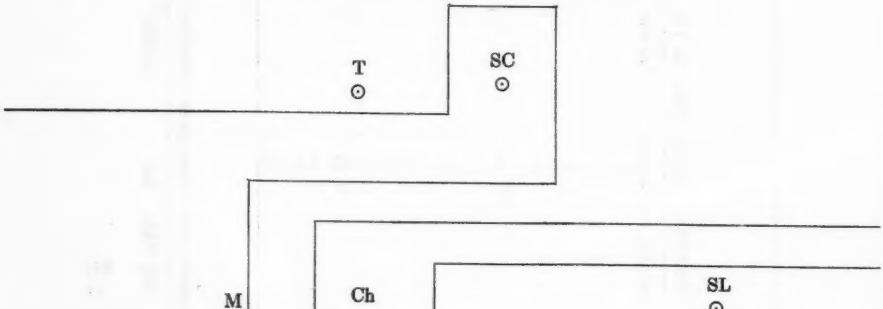


CHART 7c. Normalized Lexical Isoglosses



phonemic isoglosses as well as the normalized lexical isoglosses.

It is therefore seen that the Pocomchí and Pocomam languages do diverge from each other. It is also clear that within the languages, the separate dialects diverge, perhaps not as greatly as our preliminary hypothesis might have led us to suppose, but the divergence is clear, and is possibly increasing, rather than diminishing.

COMPARATIVE MIWOK: A PRELIMINARY SURVEY

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Take 7-18-11 F 7 7-8-60
1. Introduction
2. Phonemic systems
3. Sound correspondences
4. Cognate sets

1. Aboriginally, the Miwok family consisted of at least seven languages.[1] On the basis of structural similarity and sound correspondences, these may tentatively be grouped as follows:

I. Eastern Miwok (Mie)
  A. Sierra Miwok (Mis)
    1. Northern Sierra (Mins)
    2. Central Sierra (Mics)
    3. Southern Sierra (Miss)
  B. Plains Miwok (Mip)
  C. Saclan
II. Western Miwok
  A. Coast Miwok (Mic)
  B. Lake Miwok (Mil)

Sierra Miwok was spoken in the Sierra Nevada Mountains. Plains Miwok was spoken in various dialects from Ione to Stockton; the dialect considered here is that of Ione. Coast Miwok is closely related to Lake Miwok, and had two dialects used around Bodega Bay and in Marin County respectively. Saclan[2] may have been spoken in the area around Lafayette and Walnut Creek. Lake Miwok was the language of a small group who lived south of Clear Lake.

Saclan and Coast Miwok are probably extinct, and are known only from short vocabularies.[2a] There are modern recordings of the other five languages by L. S. Freeland (Northern, Central, and Southern Sierra Miwok),[3] Sylvia M. Broadbent (Northern, Central, and Southern Sierra Miwok), and Catherine A. Callaghan (Lake, Plains, and Northern Sierra Miwok). The last two field workers gathered their material under the auspices of the Survey of California Indian Languages, Linguistics Department, University of California, Berkeley. This article will consider only the five languages for which there are modern recordings. The different orthographies have been normalized but nowhere amended.

2. The phonemes of the Sierra Miwok languages configurate as follows:

p	t	ṭ	k	ʔ		i	y	u
	c					e		o
	s	ṣ		h			a	
m	n		ŋ					
w	l	j						

/c/ is phonetically [č] in Eastern Miwok; in Lake Miwok, the same symbol represents [ts]. /j/ is a high front semivowel in all the Miwok languages. /y/ represents a high central vowel. /ṣ/ often has the quality of [š] in Northern Sierra, and it is not certain that /s/ and /ṣ/ constitute two phonemes in this language. All the Miwok languages for which we have modern material exhibit phenomena of vocalic and consonantal length. In the Sierra languages, length can be extracted and treated descriptively as a

[1] The authors extend their gratitude to Mary R. Haas for her invaluable advice and encouragement.

[2] M. S. Beeler, Saclan, IJAL 21.201–209 (1955); Saclan Once More, IJAL 25.67–68 (1959).

[2a] Since the completion of this article, a speaker of Coast Miwok has been discovered, and substantial material is now being elicited.

[3] L. S. Freeland, Language of the Sierra Miwok, IUPAL, IJAL Memoir 6 (1951); L. S. Freeland and Sylvia M. Broadbent, Central Sierra Miwok Dictionary (with texts) (in preparation).

consonantal phoneme; for purposes of comparative convenience long vowels and consonants will here be marked by a following colon in all languages.

Plains Miwok has the phonemes listed above, except for /ŋ/ and /ṣ/. In addition, it appears to have a phoneme of stress and a central vowel /ə/, which usually has the phonetic value [ʌ].

The phonemes of Lake Miwok are as follows:

p	t	ṭ	k	ʔ	i	u
pʰ	tʰ	ṭʰ	kʰ		e	o
ṗ	ṫ	ṭ̇	k̇		a	
b	d		(g)			
	c	č				
	ċ		č̣	x̣		
(f)	s	ṣ	ɬ	h		
m	n					
w	l (r)	j				

Stress is marked, but it is morphophonemically determined, and hence is not significant in the comparisons. Phonemes in parentheses occur only in loan words; recent loans from English are not considered.

Despite the large number of consonant phonemes in Lake Miwok, cognate sets include, with rare exceptions, only the plain series of stops and /c, ṣ, h, m, n, l, j, w/. The other consonants occur infrequently, usually in loan words from neighboring Indian languages.

3. In this section certain phonological developments will be postulated in terms of the cognate sets given in the following section.[4] The principal developments, exclusive of those involving canonical forms, can be summarized in Tables I and II:

TABLE I: Consonants

PMi	Mil	PMie	Mip	PMis	Miss	Mics	Mins
*p	p	*p	p	*p	p	p	p
*t	t	*t	t	*t	t	t	t
*ṭ	ṭ	*ṭ	ṭ	*ṭ	ṭ	ṭ	ṭ
*k	k	*k	k	*k	k	k	k
*ʔ	ʔ	*ʔ	ʔ	*ʔ	ʔ	ʔ	ʔ
*č	c	*č	c	*č	c	c	c
*s	ṣ	*s	s	*s	s	s	s
*š	(-)ṣ-, -h	*š	(-)s-, -h	*š	h	ṣ	ṣ
*ṣ	ṣ	*ṣ	(-)s-, -h	*ṣ	s	s	ṣ
*h	h	*h	h	*h	h	h	h
*m	m	*m	m	*m	m	m	m
*n	n	*n	n	*n	n	n	n
*ŋ	n	*ŋ	n	*ŋ	ŋ	ŋ	ŋ
*l	l	*l	l	*l	l	l	l
*j	j	*j	j	*j	j	j	j
*w	w	*w	w	*w	w	w	w
*.	.	*.	.	*.	.	.	.

Further discussion of individual developments now follows. Where a Mis reflex is

[4] Symbols and abbreviations: Miss, Southern Sierra Miwok; Mics, Central Sierra Miwok; Mins, Northern Sierra Miwok; Mis, Sierra Miwok; Mip, Plains Miwok; Mie, Eastern Miwok; Mil, Lake Miwok; PMis, Proto-Sierra Miwok; PMie, Proto-Eastern Miwok; PMi, Proto-Miwok; Wp, Patwin; Wph, Hill Patwin; Ww, Wintu. See Harvey Pitkin and William Shipley, A Comparative Survey of California Penutian, IJAL 24.174–188 (1958).

B, recorded by Sylvia M. Broadbent; C, recorded by Catherine A. Callaghan; F, recorded by L. S. Freeland. Mis items not followed by any initial were recorded by Sylvia M. Broadbent, and Mip and Mil items not followed by an initial were collected by Catherine A. Callaghan. Hence "Miss, Mics, Mins kaw·an- C" indicates that the forms are identical in all three languages, and that the Miss and Mics forms were recorded by Sylvia M. Broadbent, and the Mins form was recorded by Catherine A. Callaghan.

(?), cognate relationship is questionable; ?, phonemic or morphemic analysis, or the validity of the reconstruction, is open to question. Three dots (. . .) are used when a phoneme or sequence of phonemes cannot be reconstructed; a phoneme or sequence in parentheses in a reconstruction is present in some languages, missing in others. Hyphens indicate morpheme boundaries. Subscript numbers in the reconstructions mean that, in one or more languages, metathesis has taken place between the two phonemes bearing the same number.

TABLE II. Vowels

PMi	Mil	PMie	Mip	PMis	Miss	Mics	Mins
*i	i	*i	i	*i	i	i	i
*e	e	*e	e	*e	e	e	e
*a	a	*a	a	*a	a	a	a
*o	o	*o	o	*o	o	o	o
*u	u	*u	u	*u	u	u	u
*y	u	*y	y, ə	*y	y	y	y

given, the three Sierra languages show identical reflexes.

PMi *p > Mis, Mip, Mil p. See ACORN MUSH, BAKE, BALL, BASKET (1), (2), BLANKET (1), BLOW (1), (2), BRAIN, CHIEF, CLOUD, CROSS COUSIN, EAGLE, EYEBROW, FATHER (1), (2), FISH, FISH EGGS, FOREHEAD, GRANDFATHER, GRAVY, GRAY HAIR, HANDGAME, HOLD, INTESTINES (1), (2), JACKRABBIT, KIDNEY, LIGHTNING (1), (2), LIPS, LOUSE (body), LUNGS, MAIDEN, ROBIN, SMOKEHOLE, SPIDER, SPREAD OUT, SWIM (1), (2), TONGUE, WOODPECKER.

PMi *t > Mis, Mip, Mil t. See ACORNS (cracked), ANT ?, BEADS ?, BEAVER (2), BLANKET (1), (2), (3), BLUEJAY ?, BRAIN, BROTHER, BROTHER (older), BUTTERFLY ?, CHOKE, CLIMB UP, EIGHT, EYE, FINGERNAIL (1), (2), TO FLY, FOREHEAD, GOPHER, GRASS, GRAY HAIR, GREEN (1), HAWK (bird), HEEL, INTESTINES (2), JUMP ?, LEAF, LOUSE (head), MAGIC ?, MOTHER, NO (1), NOSE (1), OAK (black), ONE (2) ?, OWL (1), PITCH, REST ?, ROBIN ?, SALMON, SHOOT ?, SISTER (older), SIX, SKIN, STEPFATHER, STICK, THREE, THROAT, TONGUE, TOOTH, WILDCAT, WOODPECKER ?

PMi *ṭ > Mis, Mip, Mil ṭ. See BEAR, BUTTERFLY ?, FOOT (1), FROG (1), GRAVY, HANDGAME, HOLD, LIZARD, SIT DOWN, TWO, URINATE ?

PMi *k > Mis, Mip, Mil k. See ACORN MEAL, ACORNS (cracked), APPEAR, ARROWHEAD, ASHES, BALL ?, BASKET (1), BIRD, BLACK, BLEED, BLOOD, BONE, BROWN BIRD ?, BUTTERFLY, CEDAR, CHARCOAL, CHOKE, CLOVER, COLD (2), CROW, DEFECATE, DOOR, DREAM, EAGLE, EAR ?, EAST (2), EIGHT, END, ENTER, FIRE, FIVE, FLEA, FOOT (2), FROG (1), GRASS ?, GRASSHOPPER, GRAY HAIR, HAND, HAWK (bullet), HEART, HORN, HOUSE (2), I, INTESTINES (1), LIVER, LIZARD, LOUSE (head), LUNGS ?, MEAT, MOON, MOSQUITO, NIGHT, NOSE (2), ONE (1), OWL (1), PACK BASKET, PESTLE, PINE (bull), PIÑON, POISON OAK, QUAIL (1), (2), RAIN, RAT, RIVER, SALMON, SALT, SAND, SAY, SEVEN, SHOOT, SHOUT, SISTER'S HUSBAND, SIX, SKIN, SKUNK, SMOKE (1), (2), SMOKEHOLE, SNOW, SOUR, SPIDER, STAR, TAIL, THIRD PERSON ?, THOSE, THREE, THROAT, TOOTH, TRAIL, TREE (2), TWO, UNCLE, WAIL, WATER, WHICH, WHISTLE, WIFE'S BROTHER, WORM, WORMWOOD.

PMi *ʔ > Mis, Mip, Mil ʔ. See AUNT, BAD, BEAR, BROTHER, BROTHER'S WIFE, BUCKEYE, CHILD, CLIMB UP, CLOUD, COME (1), (2), (3), COYOTE (1), (2), CROSS COUSIN, DAY (1), DEER, DIG, DREAM, DRINK, ENTER, FATHER (1), (2), FLESH, FOUR, FROG (2), GIVE, GRANDCHILD, GRANDMOTHER, HAND, HIT WITH ROCK, HOLE, JACKRABBIT, MAGIC ?, MAGPIE, MANZANITA (1), (2), MOSQUITO, MOTHER, MOUTH, NAME, NINE, NO, PINE CONE, PLAY, SIT DOWN, SLEEP, SON, STAY, SWIM (1), (2), TEN, TEARS, THIRD PERSON, THOSE, TREE (3), TURTLE, TWO, URINATE, WEST, WHICH, WOMAN, YES. In nearly all of these, PMi *ʔ is in initial position.

PMi *č > Mis, Mip, Mil c. See ARROWHEAD ?, AWL, BIRD, BLEED, BLOOD, BLOW (1), BONE, BROTHER (older), BROTHER (younger) ?, BROWN BIRD, CHEST (1), DEW, DIE, DOG, DREAM, GRANDCHILD, GRASS, GRASSHOPPER ?, GREEN (1), (2), HIT WITH ROCK, HOUSE (2), HUMMINGBIRD, LEG, LOUSE (body) ?, MORTAR ?, MOUNTAIN LION, PACK BASKET, PESTLE, PINE CONE, SAY ?, SLEEP, SOUTH, STAND (1), (2), STAY ?, TEN, URINATE ?, WINTER, WORMWOOD.

PMi *s > Mis, Mip s, Mil ṣ. See ANT, ASHES, BASKET (2) ?, BAT, BEAVER, BREAST (1), BREATHE (1), (2), CHEST (2), DEW, FISH, FOUR, GALL, GO ?, GOPHER, HAIL, SON, THIRD PERSON, WHISKERS.

PMi *š > Miss h; Mics, Mins ş; Mip h when morpheme-final, s elsewhere; Mil h

when morpheme-final, ṣ elsewhere. See AFRAID, APPEAR, BAD, BALL, BEAR, BLOW (2), CLOVER, COYOTE (2), DIE, DRINK, EAR ?, EAST (1), EYE, FEATHER, FIVE, FLEA, TO FLY, HEART, HEEL ?, KILL, LIZARD, LUNGS ?, MOSQUITO, OAK (water), OWL (2), PROPHET, ROCK, SEE, SEEK, SWIM (1), (2), TAIL, WE, WOMAN, WORM.

PMi *ṣ > Miss, Mics s; Mins ṣ; Mip h when morpheme-final, s elsewhere; Mil ṣ. See CROSS COUSIN, FINGERNAIL (1), FROST, HAWK (chicken), KIDNEY, LOUSE (body), MORTAR, PINE (bull), PIÑON, POISON OAK, SAND, SKUNK, SMOKE (1), STAR ?, YOUTH.

PMi *h > Mis, Mip, Mil h. See ARRIVE ?, BAKE, BEADS, BEAVER (2), BREATHE (1), (2), BURN (2), BUTTERFLY, BUZZARD, CHIEF, CHIN, COPULATE, DAY (1), (2), DOVE, EAST (1), (2), EGG, A FLY, FOG, FOOT (1), HEAD ?, HOUSE (1), HOW, KNEE, LEG, MEAT, MOUNTAIN LION, MUSHROOM, NO (2), NOSE (2), PROPHET, QUAIL (2), SEE ?, SKUNK, SMOKE (1), STAND (1), (2), STAR, TAIL ?, WIND, YES ?

PMi *m > Mis, Mip, Mil m. See BAT, BEAR, BEAVER (1), BLUE, BREAST (1), (2), CEDAR, CLOVER, DAY (1), DIE, FACE, FERN, FIVE ?, A FLY, GIVE, GRANDMOTHER, GRAY HAIR, HIT WITH stick (1), (2), hunt, Indian (1), (2), moon, owl (2), queen, QUIT, ROOT, SHOULDER, SIX, SOMEONE, SOUR, SOUTH, SPIDER ?, SPREAD OUT, SQUIRREL, STICK, TRAIL, TREE (1), WE, WHISKERS, WILDCAT, WINTER, YOU SINGULAR.

PMi *n > Mis, Mip, Mil n. See ACORN MEAL, ACORN MUSH, ANT, AUNT, BEAVER (2), BLANKET (3), BREATHE (1), BUCKEYE, CEDAR, CHEST (1), (2), COME (1), (2), (3), COPULATE, DEFECATE, DEW, EIGHT, END, GALL, HAIL, HEAD, I, LEG, MAN, NOSE (1), POISON OAK, PROPHET, RAIN, SALMON, SEVEN, SOMEONE, TEARS ?, TEN, THIS, TONGUE, TURTLE, WALK, WIND, WORMWOOD.

PMi *ŋ > Mis ŋ, Mip, Mil n. See EGG, FOG, HEEL, HOUSE (1), JUMP ?, KNEE, MAN, MUSHROOM, ONE (1), PIÑON, SEE ?, SHOUT, SON, TULE, URINATE. It is interesting to note that PMi *h and *ŋ are in complementary distribution: *h occurs only in initial position, *ŋ only in non-initial position.

PMi *l > Mis, Mip, Mil l. See AFRAID ?, APPEAR, AWL, BASKET (1), (2), BLACK, BLANKET (2), BLAZE, BLOW (2), BLUE, BRAIN, BROTHER (YOUNGER), BROTHER'S WIFE, BURN (2), BUTTERFLY, CHARCOAL, CHEST (2), CHILD, COYOTE (1), (2), CROW, DIG, DOVE, EAR ?, FEATHER, FERN, FISH, FLOWER, TO FLY, FOOT (2), FOREHEAD, FOX, FROG (2), GET, GROUND, HIT WITH STICK (1), (2), HOLE, HORN, HUMMINGBIRD, INTESTINES (1), (2), JACKRABBIT, LANGUAGE, LIGHTNING (1), (2), LIPS, LIVER, LUNGS, MAIDEN, MOUNTAIN LION, NIGHT, NO (2), OAK (BLACK), OAK (WATER), ONE (2), OWL (1), PACK-BASKET, PINE CONE, RAT, RIVER ?, SAND, SEEK, SHOULDER ?, SKIN, SKY, SMOKE (2), SNOW, SPREAD OUT, THREE, THROAT, TREE (1), (2), (3), TULE, WAIL, WEST, WHISKERS, WIFE'S BROTHER, WILDCAT, WOODPECKER, YOUTH.

PMi *j > Mis, Mip, Mil j. See AFRAID ?, ANT, ARRIVE, BLANKET (1), BLAZE, BLUEJAY, CHIEF, DEER, EAGLE, FISH, FOUR, FOX, HAWK (CHICKEN), HUNT, JUMP ?, KILL, KNEE, MANZANITA (1), (2), MOSQUITO, NAME, PITCH, QUAIL (1), QUEEN, REST, ROOT, SALT, SEE ?, SHOULDER ?, STICK, TEARS ?, WAIL, WHISTLE.

PMi *w > Mis, Mip, Mil w. See ACORN MEAL, ACORNS (CRACKED), BEADS ?, BLEED, BLOOD, BUTTERFLY ?, CHIN, COLD (2), DEER, DOVE, EAGLE, EIGHT, EYEBROW, FIVE, FOX, FROG (1), GALL, GET, GO, GOPHER, GREEN (2), GROUND, HAIL, HAWK (BULLET), HEART, INDIAN (1), (2), LANGUAGE, LIGHTNING (1), (2), LIPS, MOUTH, NIGHT, NINE, NO (1), OAK (WATER), PESTLE, PLAY, RIVER, ROBIN, ROCK, ROOT, SAND, SEEK, SHOUT, SISTER'S HUSBAND, SQUIRREL, TREE (3), TURTLE, WALK, WEST, WIFE'S BROTHER.

PMi *i > Mis, Mip, Mil i. See ANT, ARROWHEAD, ASHES, BASKET (2) ?, BAT, BEAR, BEAVER (2), BIRD, BLACK, BLANKET (1), (2), (3), BLEED, BLOOD, BLUEJAY, BREATHE (1), BROTHER (OLDER), BROWN BIRD, BUTTERFLY, COME (2), COYOTE (2), CRICKET, DAY

(1), (2), DEW, DOVE, EAGLE, EAST (1), EIGHT, EYEBROW, FINGERNAIL (1), (2), FISH, FOUR ?, GRASS, GREEN (1), (2), GROUND, HAIL, HEART, HEEL, HORN, HOUSE (1) ?, HOW, HUMMINGBIRD, I, INDIAN (1), (2), JACKRABBIT, LANGUAGE, LIGHTNING (1), LIZARD, LOUSE (BODY) ?, MOUNTAIN LION, NOSE (1), OAK (BLACK), OAK (WATER), ONE (2), OWL (1), (2), PESTLE, PINE CONE, PLAY, PROPHET, ROBIN, ROOT, SAND, SKUNK, SMOKE (1), SON, STAND, TAIL, TEARS, THIRD PERSON, THOSE, TONGUE, TULE, WATER, WE, WEST, WIFE'S BROTHER, YOU SINGULAR, YOUTH.

PMi *CiC(C)e... > Mis, Mip CiC(C)e..., Mil CiC(C)i... ~ CiC(C)e...; PMi *CyC(C)e... > Mis, Mip CyC(C)e..., Mil CiC(C)i.... See FIRE, GALL, PACK-BASKET, SKY, COLD (2).

PMi *a, *e assimilate to Mil o, u in the neighbouring syllable, if a k intervenes in PMi; PMi *a, *e > Mis, Mip a, e, unless an l intervenes in PMi, in which case PMi *a, *e assimilate to Mis o in a neighbouring syllable. See BROTHER'S WIFE, DREAM, EAR ?, HAND, INTESTINES, LUNGS, THREE, WILDCAT.

Elsewhere, PMi *e > Mis, Mip, Mil e. See AFRAID, ARROWHEAD ?, ASHES, AUNT, BEAVER (1), (2), BLOW (1), (2), BRAIN, BREATHE (1), (2), BROTHER (YOUNGER), CHILD, CHIN, CLIMB UP, COYOTE (1), (2), DAY (1), EAST (2), EYEBROW, FLOWER, TO FLY, FOG, FOOT (1), FOREHEAD, FOX, GET, GRANDCHILD, GRAY HAIR, HAWK (BIRD), HAWK (BULLET), HIT WITH ROCK, JACK-RABBIT, LIGHTNING, LIPS, LOUSE (HEAD), MAGIC, MANZANITA (1), (2), MOON, MORTAR, MUSHROOM, NINE, NO (1), (2), OAK (BLACK), ONE (1), PINE CONE, QUAIL (2), REST, ROOT, SEE ?, SEEK, SEVEN, SHOULDER, SISTER (OLDER), SIT DOWN, SIX, SLEEP, SNOW, SQUIRREL, THIS, TONGUE, TREE (2), WHICH, WHISKERS, WIND, WORM.

PMi *a > Mis, Mip, Mil a, unless *k or *l intervene between it and *o or *u in a neighbouring syllable in PMi (see above). See ACORN MEAL, ACORN MUSH, ACORNS (CRACKED), AFRAID, ANT, APPEAR, ARRIVE, AWL, BASKET (1), (2), BEAR, BIRD, BLEED, BLOOD, BLUEJAY, BROTHER, BROTHER (OLDER), BROTHER (YOUNGER), BUTTERFLY, CHARCOAL, CHIEF, CLOUD, CLOVER, COPULATE, COYOTE (2), CROSS COUSIN, CROW, DAY (1), DEER, DEFECATE, DIE, DOOR, EAGLE, EIGHT, END, FACE, FATHER (2), FEATHER, FERN, FISH, FIVE, FOOT (1), FOUR ?, FROG (1), FROST, GIVE, GRANDCHILD, GRANDFATHER, GRANDMOTHER, GRASS ?, GRAVY, GROUND, HAIL, HANDGAME, HEAD, HOLD, HOLE, HOUSE (1), (2), I, JACK-RABBIT, JUMP, KIDNEY, LANGUAGE, LEAF, LIVER, LIZARD, MAGPIE, MAN, MOTHER, MOUNTAIN LION, MOUTH, NAME, NIGHT, NO (2), OAK (LIVE), PESTLE, PINE (BULL), PINE CONE, PIÑON, PLAY, QUAIL (1), QUEEN, RAIN, RIVER, ROBIN, ROCK, ROOT ?, SAND, SAY, SEVEN, SHOUT, SISTER'S HUSBAND, SIX ?, SKIN, SMOKE (1), (2), SMOKEHOLE, SNOW, SOMEONE, SON, SOUR, SPREAD OUT, STAND (1), (2), STAR, STEPFATHER, STICK, TEARS ?, TEN, THIRD PERSON ?, THROAT, TREE (1), (2), (3), TURTLE, UNCLE, URINATE, WAIL, WE, WHISTLE, WILDCAT, WIND, WOMAN, WOODPECKER, YOUTH.

PMi *o > Mis, Mip, Mil o. See BALL, BEADS, BLANKET (2), (3), BROTHER'S WIFE, BUTTERFLY, CEDAR, CHOKE, CLOUD, COME (2), COYOTE (1), DIG, EAR, FIVE, FLESH, FLOWER, A FLY, FOOT (2), FOREHEAD, FOUR, FROG (2), GRASSHOPPER, GRAVY, GRAY HAIR, HOLE, HOUSE (2), HUNT, KILL, KNEE, LEG, LUNGS, MOON, MORTAR, MOUTH, NAME, NINE, NOSE (1), RAT, SALT, SIT DOWN, SIX ?, SPIDER, SPREAD OUT, STAR, THOSE, THREE ?, THROAT, TWO, URINATE, WEST, WIFE'S BROTHER, WILDCAT, WOMAN.

PMi *u > Mis, Mip, Mil u. See ACORNS (CRACKED) ?, BAKE, BASKET (1), BLACK, BLOW (1), (2), BLUE, BRAIN, BREAST (1), (2), BUCKEYE, BUZZARD, CHARCOAL, CHEST (1), DOG, DOVE, DREAM, DRINK, EAST (2), ENTER, FERN, FOX, FROST, HAND, HAWK (CHICKEN), INTESTINES (1), MAGIC, MAIDEN, MEAT, MUSHROOM, NOSE (2), ONE (2), OWL (1), (2), PITCH, PROPHET, QUAIL (1), SALMON, SPIDER,

STAY, STICK, TAIL, TRAIL, WHISKERS, WHISTLE, WINTER.

PMi *y > Mis y; Mip ə when stressed or when unstressed if the stressed vowel is ə, y elsewhere; Mil u. See ACORN MUSH, ARRIVE, AWL, BAD, BEAR ?, BEAVER (1), BLANKET (1), BLAZE, BONE ?, BURN (2), CHEST (1) ?, (2), CHILD, CLIMB UP, COME (1), CROSS COUSIN, DEER ?, DEFECATE, EYE, FATHER (1), FINGERNAIL (1), FLEA, TO FLY, GO ?, GOPHER, HANDGAME, HEART, HEEL, HIT WITH STICK (1), (2), HOLD, LIVER ?, LOUSE (BODY), MOSQUITO, MOTHER ?, NIGHT, NO (1), PINE (BULL), POISON OAK ?, QUIT, RAIN, REST, SEE, SHOOT, SOUTH, SWIM (1), (2), TOOTH, WALK ?, YES.

PMi *· > Mis, Mip, Mil ·. See ACORN MEAL, ACORN MUSH, ACORNS (CRACKED), ANT, ARRIVE, ASHES, AWL, BAD, BASKET (1), (2), BEAR, BEAVER (1), (2), BLANKET (2), (3), BLOOD, BLOW (1), (2), BRAIN, BREAST (1), (2), BREATHE (2), BROTHER (OLDER), BUCKEYE, BUTTERFLY, CHEST (2), CHIN, CLOUD, COME (1), (2), COPULATE, COYOTE (2), CROW, DAY (1), (2), DEER, DIG, DOVE, EAGLE, EGG, EYEBROW, FERN, FINGERNAIL (1), (2), FISH, FIVE, FLESH, FLOWER, A FLY, TO FLY, FOOT (1), FOREHEAD, FROST, GALL, GIVE, GOPHER, GRASSHOPPER, HAND, HANDGAME, HAWK (BIRD), HEAD, HEEL, HIT WITH STICK (2), HOLD, HOLE, HORN, HUMMINGBIRD, I, INDIAN (1), (2), JACKRABBIT, KILL, LEAF, LEG, LIVER, LIZARD, MANZANITA (1), (2), MEAT, MORTAR, MOSQUITO, MOUNTAIN LION, MOUTH, NAME, OAK (BLACK), OAK (LIVE), OAK (WATER), ONE (1), OWL (1), (2), PESTLE, PINE (BULL), PINE CONE, PROPHET, QUAIL (1), (2), RAIN, RIVER ?, ROBIN, ROOT, SALT, SAY, SEVEN, SISTER (OLDER), SKUNK, SKY, SLEEP, SMOKE (1), (2), SMOKEHOLE, SNOW, SOUTH, SPIDER, SQUIRREL, STAND (1), STAR, STAY, STEPFATHER, TAIL, TEN, THIRD PERSON, THIS, THOSE, THROAT, TONGUE, TREE (1), (2), TULE, WAIL, WE, WHICH, WHISPERS, WOMAN, WORM, YES.

Stress appears to be phonemic in Mip. Hence stress is reconstructed for PMie and PMi forms where a Mip reflex is cited.

The remaining correspondences concern canonical forms rather than individual phonemes. In each case, the rules given apply only if the form in the proto-language includes the whole segment under consideration. In this section, X and Z are purely formulaic, and do not have their usual phonetic values.

PMi *-VXC- > Miss, Mics -VC·-, Mins -V·C-. The reflexes in Mip and Mil are uncertain. It is possible that these are instances of *-VZC- (see below), where Mins has borrowed a Mip form. See BEADS, CHILD, EIGHT, FOUR, GET ?

PMi *-VZC- > Mis -VC·-, Mip -V·C-, Mil -VC·- in non-word-final position, but -VC (NOSE (2), TRAIL, WATER) or -V·C (LOUSE (HEAD), WATER) in word-final position. See CHARCOAL, FOX, GROUND, KNEE, LOUSE (HEAD), MAN, NO (2), NOSE (2), PLAY, SHOULDER ?, TOOTH, TRAIL, WATER.

PMi *CVCV̆·C > Miss CVCV·C- (non-final), CVCVC (final); Mics, Mins CVCV·C-; Mip, Mil CVCV̆·C- (non-final), CV̆CVC (final). See BLEED, FLY, NIGHT, POISON OAK, SALMON ?, WAIL.

PMi *CV·(C) > Mis CV·(C)-, Mip CV·(C), Mil CV·(C) (final), CV(C)- (non-final). See BEAVER (1), CEDAR ?, END, ENTER, GET ?, HIT WITH ROCK, HIT WITH STICK (1), INDIAN (1), SISTER'S HUSBAND, SLEEP, THIS, WALK ?

In all cases but one (THIS) where the Mil and Mip reflexes have the form CV·, the most closely comparable Mis forms are longer. Stems of the CV· canon are very rare in the Sierra languages. No rules can be formulated to account for the missing sequences in Mil and Mip if it is assumed that the longer Mis forms are primary. It is therefore possible that the Mil and Mip forms in these cases are monomorphemic, while the Sierra forms consist of a stem plus a suffix. The sequences which are found in the Mis forms, but not in the Mil or Mip forms in these cases, have the form -C(·)V(·)-. See BREAST (1) and (2), DAY (2) and EAST (1), DOOR, FINGERNAIL (1) and (2), FISH EGGS.

Metathesis occurs in one or more of the

languages in a number of cases. Most commonly, it involves length and another phoneme: see BAKE, BEAR, DEW, DOVE, DRINK, EAST (2), HAIL, LIGHTNING (1), OWL (1), PACK BASKET, QUIT, ROCK, THREE. For metatheses not involving length, see BLUE-JAY, DREAM, EAR, INTESTINES, TO SPREAD OUT, TONGUE. No rules have been formulated to predict the occurrence of metathesis.

Apart from the above considerations, the canonical forms regularly show the same reflexes in all the Miwok languages.

4. In this section, possible cognate sets between two or more of the five Miwok languages for which we have modern recordings will be listed. They are arranged in alphabetical order according to the English glosses. This listing of cognate sets is by no means exhaustive; it is intended merely to establish the principal sound correspondences between these languages.

Reconstructions are attempted at three levels: Proto-Sierra Miwok, Proto-Eastern Miwok, and Proto-Miwok. A Proto-Sierra Miwok reconstruction is made if at least two of the Sierra Miwok languages are represented in the set. If Plains Miwok and at least one of the Sierra Miwok languages show cognates, a Proto-Eastern Miwok reconstruction is given. Since Plains Miwok and Northern Sierra Miwok are geographically contiguous and extensive borrowing between them is to be expected, a Proto-Eastern Miwok reconstruction based on these two languages alone is subject to question. A Proto-Miwok reconstruction is attempted only when the set in question includes a Lake Miwok form and at least one Eastern Miwok form.

In the following sets, it will be noted that where a form taken from Freeland is quoted alongside forms collected by Broadbent or Callaghan, Freeland's recording often has a final /y/ which is not present in Broadbent's or Callaghan's. This represents a difference in morphemic analysis. The present authors segment this final /y/ with the case and pronominal suffixes; Freeland considers it part of the stem. In making reconstructions, Freeland's final /y/'s have been ignored.

In some cases, Freeland has recorded /ṭ/ where the present authors have /t/. This divergence is probably partly due to a difference in orthographic systems. In Freeland's original orthography, it is the front t which has a distinguishing mark, /ṭ/; in ours, it is the back t, /ṭ/. If these distinguishing marks have been erroneously omitted, Freeland's recordings transcribed in our orthography appear as /ṭ/, while similar errors on our part will show /t/. Unfortunately, in many cases it is impossible to decide which recording is erroneous without rechecking in the field.

The list of cognates now follows.

ACORN MEAL. Miss, Mics, Mins kaw·an- C, PMis *kaw·an-; Mip káw·an, PMie *káw·an-.

ACORN MUSH. Miss nyp·a·-ti-, Mics, Mins nyp·a-, PMis *nyp·a-.

ACORNS, CRACKED. Miss watuk·a-, Mics watuk·a- B, watyk·a- F, Mins wato·-l- *to crack*, PMis *watuk·a- < *wato/u- ?

AFRAID, TO BE. Miss helaj-ŋe-, Mics ṣekýj-ŋe- F (?), Mip sèl·aj-ku- ?, PMie *šél(·)aj- ?; Mil ṣélpi, PMi *šél... ?

ANT. Mics ṭisí·najy- F, Mins tisí·naj- C, PMis *t/ṭisi·naj-; Mip tisí·naj, PMie *t/ṭisí·naj-.

APPEAR, TO. Miss lakh-, Mics lák-ṣy- F, PMis *lak-š-.

ARRIVE, TO. Miss, Mics F, Mins hý·ja- F, PMis *hy·ja-; Mil ʔujé· *come on*! (?).

ARROWHEAD. Miss, Mics kice-, PMis *kiče-; Mil kíw·a *arrow*, PMi *ki... ?

ASHES. Miss, Mins sik·e- C, PMis *sik·e-; Mip sík·e-, PMie *sík·e-.

AUNT, PATERNAL. Miss ʔene-, Mics ʔene·- F, Mins ʔene- *maternal aunt* C, PMis *ʔene-; Mip ʔené·c·i- *uncle's wife*, PMie *ʔené-; Mil ʔené·ni, PMi *ʔené... .

AWL. Miss, Mics, Mins cyl·a-, PMis *čyl·a-.

BAD. Miss ʔyh·y-ty-m·a-, Mics ʔyṣ·y- F, PMis *ʔyš·y-.

BAKE, TO. Mics hú·p- F, Mil húp·u, PMi *hup$_{ı}$·$_{ı}$... .

BALL. Miss pohko-, Mics póṣko- F, PMis *poško-; Mil pów·olo *round*, poló·lo *oak ball*, PMi *po... .

BASKET (1). Miss pulak·a-, Mins pulak·a- B, palák·a- F, PMis *pulak·a- ?

BASKET (2). Miss polis·a-, Mics pulis·a- F, PMis *po/ulis·a-; Mip pulúc·i-, PMie *pul... ?

BAT. Mins C, Mip símsi-, PMie *símsi-.

BEADS. Miss how·ot, Mics hów·oṭu- F, Mins ho·wot-, PMis *hoXwot-; Mip hó·wot, PMie *hoXwot-; Mil hú·ja (?). The Northern Sierra form may be borrowed from Plains Miwok, in which case the reconstruction should be PMie *hoZwot-.

BEAR. Miss ?yhy·maṭi-, Mics ?yṣý·maṭi-, Mins ?ysy·maṭi-, PMis *?yšy·maṭi-; Mip ?ysym·áṭi-, PMie *?yšy·$_{ı}$m$_{ı}$áṭi-.

BEAVER (1). Miss, Mics me·sy-, PMis *me·s/ṣy-.

BEAVER (2). Mins hèn·ít- C, Mip hén·it, PMie *hén·it-.

BIRD. Miss, Mics cicka-, PMis *čička-. Cf. BROWN BIRD.

BLACK. Miss, Mics, Mins kul-ul·i-, PMis *kul-ul·i-; Mip kulú?lu-, PMie *kul-; Mil kúle *black bear, grizzly bear* (?), PMi *kul... ? Cf. CHARCOAL. The Mis and Mip forms illustrate common patterns of color-word formation in these languages.

BLANKET (1). Miss, Mics, Mins jypti-, PMis *jypti-; Mip jópti-, PMie *jýpti-.

BLANKET (2). Miss, Mics tol·i-, PMis *tol·i-. Cf. BLANKET (3).

BLANKET (3). Mics F, Mins ton·i-, PMis *ton·i-. Cf. BLANKET (2).

BLAZE, TO. Mics jýl-ty- F, Mil júl-en *to burn off*, PMi *jyl-.

BLEED, TO. Miss, Mics kicá·w- F, PMis *kiča·w-; Mip kicá·w-, PMie *kičá·w-; Mil kícaw, PMi *kičá·w. Cf. BLOOD.

BLOOD. Miss, Mics, Mins kic·aw-, PMis *kič·aw-; Mip kíc·aw-, PMie *kíč·aw-; Mil kíc·aw, PMi *kíč·aw. Cf. TO BLEED.

BLOW WITH THE MOUTH, TO (1). Mins C, Mip púce, PMie *púče; Mil púc·aṭi, PMi *púč... .

BLOW WITH THE MOUTH, TO (2). Miss puhe·-l-, Mics puṣe·-l- F, PMis *puše·-l-.

BLUE. Mip mulú?lu-, Mil mulú·mulu *black*, PMi *mul-.

BLUE JAY. Miss tajic·u-, Mics taj·iṣmu- B, ṭajiṣ-mu- F, Mins ṭajṭi- B. tájti- C, PMis *t/ṭaj...; Mip sájsi-, Mil ṣají·c. Cf. Wph ćayet, Ww čayik.

BONE. Miss, Mics, Mins kyc·yc-, PMis *kyč·yč-; Mip kə́cəc, kycə́c·ə-, PMie. *kýč(·)yč- ?; Mil kúlum, PMi *ký... .

BRAIN. Miss, Mics, Mins lup·et-, PMis *lup·et-; Mip lúp·et, PMie *lúp·et-.

BREAST (1). Miss, Mics mú·su- F, Mins mu·sy-, mó·su- C, PMis *mu·su-; Mip mú·su-, PMie *mú·su-. Cf. BREAST (2).

BREAST (2). Mip, Mil mú·, PMi *mú·. Cf. BREAST (1).

BREATHE, TO (1). Miss hensi-, Mics hén-si- F, Mins henis·e? F (Stem 2 < hensi- ?), PMis *hen-si-; Mil hen-kaṭi, PMi *hen-.

BREATHE, TO (2). Mins hé·se-, hés·e- ? C, Mip hés·e-, PMie *hés·e- ?

BROTHER. Miss ?yta- *younger sibling* (?), Mip ?atá-c·i-, Mil ?atá· (vocative), PMi *?ata(·). Cf. MOTHER.

BROTHER, OLDER. Miss, Mics, Mins ta·ci-, PMis *ta·či-.

BROTHER, YOUNGER. Mics cale- B, calé·- F, Mins cali-t·i-, PMis *čalV-; Mil ṣule- *baby*. Cf. YOUTH.

BROTHER'S WIFE. Miss ?olo-, Mics ?olo- B, ?oló·- F, PMis *?olo-; Mip ?olá·ci- *mother's sister*, ?óla- *father's brother*, PMie *?ola(·)... ?

BROWN BIRD. Miss cikcik, Mip cíkcik, PMie *číkčik-; Mil cilá·t, PMi *či... .

BUCKEYE. Miss, Mins ?u·nu-, PMis *?u·nu-; Mip ?ú·nu-, PMie *?ú·nu-; Mil ?ú·nu, PMi *?ú·nu.

BURN, TO. Mip hólsi, Mil húl-ih, PMi *hýl... .

BUTTERFLY. Mics hol·ok·itiw·a- B, hol·ok·iṭiwa- F, Mins hol·ok·itiw·a-, PMis hol·ok·it/ṭiw(·)a-; Mip hòl·ok·iṭíwa-, PMie *hol·ok·it/ṭiw(·)a-; Mil woló·lok.

BUZZARD. Miss hu·tawe-, huhu-, Mics hu?·uṣ- B, hú·ṣuwija- F, Mins hu?·us- C, PMis *hu... ; Mil húṣ. Cf. Wp hu·s.

CEDAR. Miss mo·nok, Mics mo·nok- B, mó·nuku- *cypress* F, Mins mo·nok-, PMis *mo·nok-; Mil mónmon-?ala, PMi *mo·n- ?

CHARCOAL. Miss, Mics kul·a- *coals* F, PMis *kul·a-; Mip kú·la-, PMie *kúZla-; Mil kúṣ·a, PMi *kúZCa.

CHEST (1). Mins C, Mip nýcu-, PMie *nýču- ?

CHEST (2). Miss nysy·li-, Mics nysy·ly- F, PMis *nysy·l... .

CHIEF. Miss haja·pu-, Mics, Mins haja·po-, PMis *haja·pu/o-; Mil hójpu, PMi *haj(a·)-pu/o ?

CHILD. Miss, Mics ?esel·y- F, Mins ?ehe·ly- C, F, PMis *?eCeXly-; Mil ?é·ṣ, PMi *?e(·)s... ?

CHIN. Miss hew·etkil *lower lip*, Mics hewé·ly- *lower lip* F, Mins hew·e- C, PMis *hew(·)e... ; Mip hèw·é-, héw·e-, PMie *hew(·)é... ; Mil héw·e, PMi *hew(·)é... .

CHOKE, TO. Miss to·k-, Mics tókwu- F, PMis *to(·)k... ; Mil cúkleṭi (?).

CLIMB UP, TO. Miss ?ety·m-, Mil ?ét·u, PMi *?et(·)y... .

CLOUD. Miss, Mics, Mins ?o·pa-, PMis *?o·pa-; Mil ?ú·pa *to rain*, PMi *?o/u·pa.

CLOVER. Miss hakham, Mics ṣakṣam-, PMis *šakšam-.

COLD (1). Mip tistí, Mil tíṣ-wa, PMi *tis... . Cf. Mics ṭýn·a- F, Mins ṭùṭ·úsu- C.

COLD (2). Miss kywkyw·-e- *to be cold*, kyw-ŋe- *to become cold*, kyw-e·ŋ-a- *cold*, Mil kí·wil *ice*, PMi *ky(·)w(e)... .

COME, TO (1). Miss ?yn·-, Mics F, Mins ?ýn·y- F, PMis *?yn·-; Mip ?ón·ə, PMie *?ýn·-.

COME, TO (2). Mip, Mil ?ó·ni PMi *?ó·ni.

COME, TO (3). Mip ?ənś, Mil ?ínaj *to approach*, PMi *?ynV̂... .

COPULATE, TO. Mics hýn·a- F, Mil hón·amṭi, PMi *hVn·a-.

COYOTE (1). Mins ?olé?cu- C, Mip ?olé-t·i-?, PMie *?olé-; Mil ?óle, PMi *?olé. The Mip form appears to contain -t·i-, which is a common diminutive suffix in the Sierra languages.

COYOTE (2). Miss ?ahe·li-, Mics ?aṣe·li- F, PMis *?aše·li-.

CRICKET. Miss tit·i?na-, Mins tít·i- C, PMis *tit·i... ; Mip cúc·u-, cucúc·u- (?), Mil kiṭí·ṭen (?).

CROSS COUSIN. Miss, Mics ?ypsa-, Mins ?ypṣa- *nephew* C, PMis *?ypṣa-.

CROW. Miss ka·kul *Brewer blackbird*, Mics ká·kulu- F, PMis *ka·kul-; Mil ká·kali, PMi *ka·kul... ? The Mil form may be a loan from Costanoan.

DAY (1). Miss, Mics, Mins hi?e·ma- C, PMis *hi?e·ma-. Cf. DAY (2).

DAY (2). Mip, Mil hí·, PMi *hí. Cf. DAY (1), EAST (1).

DEER. Mics, Mins ?ywy·ja-, PMis *?ywy·ja-; Mip ?ywý·ja-, PMie *?ywý·ja-. Cf. Miss, Mics ?yw·y- *to eat* F; PMis *?yw·y- *to eat* > PMis *?ywy·ja- *deer*.

DEFECATE, TO. Mics kyna·ṭ- F, Mip kə́na *excrement*, PMie *kýna... ; Mil kún-uh, PMi *kýn... .

DEW. Mip sicí·ni-, Mil ṣic·ini, ṣíc·in, PMi *sič·$_{i}$i$_{i}$n(i).

DIE, TO. Miss camh-, Mics cám-ṣy- F, Mins camsy- F, PMis *čam-h-; Mil ca·m, cam-ú·ṭa *to die out*, PMi *ča(·)m. Cf. Mip cém?en.

DIG, TO. Miss ?ol·-, Mics F, Mins ?ól·u- F, PMis *?ol·-; Mip ?ól·-, PMie *?ól·-. Cf. Mil ?ál-ih, ?á·l-ih *to dig out*.

DOG. Miss, Mics cuku·- F, Mins cuku-, PMis *čuku·-; Mip cú·cu-, PMie *čú... ; Mil čú·ču *puppy's name*. The Mip form may show consonantal assimilation; it is also possible that the Mip and Mil forms may be borrowed from colloquial Spanish chucho *dog*.

DOOR. Miss kata-, Mics katá·- F, PMis *kata(·)-; Mil ká·, PMi *ka... .

DOVE. Miss hul·u·wi-, Mics húl·uw·i- F, Mins hùl·ú·wi- C, PMis *hul·u·$_{i}$w$_{i}$i-; Mip hùl·úl·i-, PMie *hul·ú·$_{i}$C$_{i}$i-. The Mip form may show consonantal assimilation.

DREAM, TO, Miss hukuc-ŋe- ?, Mics

ʔúkcu- F, Mins ʔúkcu-, ʔúkuc *dreaming* C, PMis *ʔukc$_1$u$_1$- ʔ; Mip ʔékcu-, ʔékuc- ʔ, PMie *ʔékc$_1$u$_1$- ʔ; Mil ʔúkuc, PMi *ʔékc$_1$u$_1$- ʔ

DRINK, TO. Miss ʔuhu·-, Mics ʔúṣ·u- F, PMis *ʔuš·$_1$u$_1$-; Mip ʔús·u, PMie *ʔúš·$_1$u$_1$-; Mil ʔúṣ·u, ʔú·ṣu, PMi *ʔuš·$_1$u$_1$-, *uš$_1$·$_1$u-.

EAGLE. Miss wip·ajak, Mics wip·aja·k-, PMis *wip·aja·k-.

EAR. Miss ṭolkoh, Mics ṭo·koṣ- F, Mins to·koṣ-, PMis *ṭo·/lkoš-; Mip soló·to-, PMie *š$_1$o(l) (k)ó(·)ṭ$_1$- ʔ; Mil ʔálok, PMi *š$_1$a(1) (k$_2$)ó$_2$(·)ṭ$_1$ ʔ Cf. Saclan aloco.

EAST (1). Miss hi·hy-, Mics hi·sy- F, Mins hiṣu·wik B, hisów·it C, PMis *hi·šy- ʔ Cf. *day* (2).

EAST (2). Mip hùk·é·-wi-t, Mil hú·ke *first* húke *past*, PMi *hu·$_1$k$_1$e-. In Lake Miwok mythology, certain important elements are said to originate in the east.

EGG. Miss, Mics hoŋ·u-, Mins haŋ·y-, PMis *hVŋ·... .

EIGHT. Miss kaw·inta-, Mics kaw·inṭa- F, Mins ka·winta-, PMis *kaXwinta-; Mip kaw·ínta-.

END. Miss, Mics na·k- *to reach* F, PMis *na·k-; Mil nák-ah, PMi *na·k-.

ENTER, TO. Miss, Mics ʔu·k- F, PMis *ʔu·k; Mil ʔúk-an, PMi *ʔu·k-.

EYE. Miss hynty-, Mics ṣynty-, Mins ṣyt·y-, PMis *šynt- ʔ; Mil ṣút, ṣút·-, PMi *šynt- ʔ Cf. Mutsun xin.

EYEBROW. Miss, Mics F, Mins piw·e-, PMis *piw·e-.

FACE. Miss mat·a-lki-, Mics ma·kaṣ-, PMis *ma... .

FATHER (1). Miss, Mics ʔypy·- F, Mins ʔypy-, PMis *ʔypy·-.

FATHER (2). Mip ʔáp·a-, Mil ʔáp·i, ʔapí· (vocative), PMi *ʔáp·i ʔ Vowel harmony is postulated in Mip.

FEATHER, WING. Miss hala·-, Mics ṣalá·- F, Mins ṣála- F, PMis *šala·-; Mip sále-, PMie *šále(·) ʔ; Mil ṣále, PMi *šále(·) ʔ Vowel harmony is postulated in Mis.

FERN. Mip, Mil múl·a, PMi *múl·a.

FINGERNAIL (1). Miss tis·y·- *finger*, *hand*, Mics ṭís·y- *hand* F, Mins tíṣ·y- C, PMis *tiṣ·y-.

FINGERNAIL (2). Mins tí·ʔ-sy- ʔ C, Mip tí·, PMie *tí·- ʔ; Mil tí·, PMi *tí· ʔ

FIRE. Miss wyke-, Mics wyké·- F, Mins wyke- C, PMis *wyke-; Mip wyké-, PMie *wyké-; Mil wíki, PMi *wyké.

FISH. Miss lapi·saj-, Mics lapí·sajy- *minnow* F, Mins lapi·saj-, PMis *lapi·saj-.

FISH EGGS. Miss pyle- ʔ (ʔ), Mip pú· *fish*, Mil pú·, PMi *pú· ʔ

FIVE. Miss mah·ok·a-, Mics maṣ·ok·a-, Mins maṣ·ok·a- C, PMis *maš·ok·a-; Mip kàs·ók·o-, PMie *Caš·ok·V-.

FLEA. Miss kykyh ʔ, Mics, Mins ky·kyṣ-, PMis *ky·kyš- ʔ; Mip kókəh, PMie *ký(·)-kyš-; Mil kúkuh, PMi *ký(·)kyš.

FLESH. Mics ʔóc·uku- F, Mil ʔót·a, PMi *ʔo... .

FLOWER. Miss lo·je-, Mics, Mins lo·je-ma-, PMis *lo·je-.

FLY, A. Mics homo·koṣ-, Mins homo·maj-, PMis *homo·... ; Mip homó·maj, PMie *homó·... .

FLY, TO. Miss hyle·t-, Mics F, Mins ṣyle·t- C, PMis *šyle·t-; Mip sylé·t-, PMie *šylé·t-; Mil lil-ú·ṭi, PMi *šylṼ... ? It is suggested that consonantal assimilation has taken place in Mil.

FOG. Miss huŋe-, Mics hyŋé- F, PMis *hu/yŋe-; Mip huné-, PMie *hu/yŋé-.

FOOT (1). Miss, Mics haṭ·e-, PMis *haṭ·e-.

FOOT (2). Mins kólo- C, Mip koló-, PMie *koló-; Mil kólo, PMi *koló.

FOREHEAD. Mics top·ele- B, ṭóp·ele- F, Mins top·ele-, PMis *top·ele-.

FOUR. Miss, Mics ʔojis·a- B, ʔój·is·a- F, Mins ʔoji·sa-, PMis *ʔojiXsa-; Mip ʔojséko-, PMie *ʔoj... .

FOX. Miss, Mics, Mins juw·el-, PMis *juw·el-; Mip jú·wel, PMie *júZwel-.

FROG (1). Miss waṭak-na-, Mics waṭak-saʔji-, Mins waṭak-ṣaji-, PMis *waṭak-; Mip witíkwotàk *sound of frog*.

FROG (2). Miss ʔol·oʔja-, Mics ʔol·oʔṣaj·i- B, ʔól·oʔṣa·ji- *toad* F, PMis ʔol·oʔ... ; Mil koló·lo.

FROST. Miss, Mics sus·a-, Mins ṣuṣ·a- *ice*, PMis *ṣuṣ·a-; Mip súṣ·a-, PMie *ṣúṣ·a-; Mil ṣúṣ·a, PMi *ṣúṣ·a.

GALL. Miss siw·en *gall bladder*, Mins siw·én- C, PMis *siw·en-; Mip síw·en, PMie *síw·en-; Mil ṣíw·in. PMi *síw·en.

GET, TO. Miss wel·-, Mics F, Mins wé·l- F, PMis *weXl- ?, *we·l- ?; Mil wél-ik, PMi *we·l- ?

GIVE, TO. Miss ?am·-, Mics F, Mins ?am·y- F, PMis *?am·-.

GO, TO. Miss wyks-, Mics wýkṣy- F, Mins wyks-, PMis *wyks- ?; Mip wí·ta-, Mil wé·-ṭa.

GOPHER. Miss, Mics, Mins syw·yt-, PMis *syw·yt-; Mip sów·ət, PMie *sýw·yt-; Mil ṣuw·ut, PMi *sýw·yt.

GRANDCHILD. Miss ?ace-, Mics ?ace- B, ?acé·- F, Mins ?ace- *grandson* C, PMis *?ače-.

GRANDFATHER. Miss, Mics, Mins pa·pa- C, F, PMis *pa·pa-; Mip pá·pa-, PMie *pá·pa-; Mil pápa, PMi *pá(·)pa.

GRANDMOTHER. Miss ?ama-, Mics ?ama- B, ?amá·- F, Mins ?amá·li- C, PMis *?ama...; Mil háma, PMi *Cama... .

GRASS. Miss cit·ak, Mics cit·aky- F, PMis *čit·ak-; Mip cité·na- *meadow*, PMie *čit... . Cf. also Mins co·kiṭa-.

GRASSHOPPER. Mics, Mins ko·co-, PMis *ko·čo-; Mip kó·co-, PMie *kó·čo-; Mi kó·ṭo, PMi *kó·Co.

GRAVY, THICK. Mins C, Mip póṭa, ?, PMie *póṭa; Mil póṭa *foam*; *semen*, PMi *póṭa.

GRAY HAIR. Miss, Mins potok-me-, PMis *potok-me-; Mil potó·poto *gray*, PMi *pot- ? The Mil form illustrates a common pattern for color adjectives in this language.

GREEN (1). Miss cit-it·i-, Mics citit·-i- F, PMis *čit-it·i-; Mip cití?ti-, PMie *čit-. Cf. GRASS. Most Mis and Mip color adjectives are formed according to the pattern illustrated here; cf. *black*, *blue*.

GREEN (2). Miss ciw-iw·i-, Mip ciwí·ty-, PMie *čiw-; Mil ṣiwí·ṣiwi, PMi *Ciw-.

GROUND. Miss wal·i- *low*, *down*, Mics wal·i- *down*, *earth*, *world*, Mins wal·i-, PMis *wal·i-; Mip wá·li-, PMie *wáZli-; Mil wál·i *outside*, wáli *world*, PMi *wáZli.

HAIL. Miss sa·wina-, Mics sáw·ine- F, Mins sa·wini-, PMis *sa·$_1$w$_1$in... ; Mip sawí·ny-, PMie *sa(·$_1$)w$_1$i(·)n... .

HAND. Mins ?úk·u- C, Mip ?ék·u-, PMie *?ék·u- ?; Mil ?úk·u, kedék·u *five*, PMi *?ék·u ? Mil kedék·u *five* is derived from ket- *one* and -ék·u *hand*.

HANDGAME. Mics páṭ·y- *gambling bones* F, Mins paṭ·y-, PMis *paṭ·y-. Cf. HOLD.

HAWK, BIRD. Mics tét·ete- *sparrow hawk* F, Mins tét·ete- C, PMis *tet·ete-; Mip tét·ete- *sparrow hawk*, PMie *tét·ete-.

HAWK, BULLET. Miss wekwek, Mics wékweky- *prairie falcon* F, Mins wekwek-, PMis *wekwek-; Mip wékwek, PMie *wékwek-; Mil wékwek, PMi *wékwek.

HAWK, CHICKEN. Miss suju- ?, Mics suj·u-, Mins ṣuj·u-, PMis *ṣuj·u- ?; Mip súj·u-, PMie *ṣúj·u- ?; Mil ṣúj·u, PMi *ṣúj·u ?

HEAD. Miss, Mics, Mins han·a-, PMis *han·a-; Mil cán·a, PMi *Can·a.

HEART. Miss wyhki-, Mics, Mins wyṣki-, PMis *wyški-; Mip wóski-, PMie *wýški-; Mil wúṣki *insides*, PMi *wýški.

HEEL. Miss Týŋ·ih, Mics tyŋ·iṣy- *sole of foot* F, Mins tyŋ·is- C, PMis *tyŋ·iš- ?; Mip tón·i-, PMie *týŋ·iš- ?; Mil túṇ·i, PMi *týŋ·iš ?

HIT WITH ROCK, TO. Miss ce·?-, Mics cé·?- *to throw overhand* F, PMis *če·?; Mil ce?-á·ṭi *to knock down*, PMi *če·?-.

HIT WITH STICK, TO (1). Miss my·l-, Mics mýl-ja- F, PMis *my(·)l-; Mil múl-a (semelfactive), PMi *my·l-.

HIT WITH STICK, TO (2). Mins myl·a- *to fight* F, Mil múl·-a-(iterative), PMi *myl·--a- ?

HOLD, TO. Miss paṭy·- *carry in hands*, Mics paṭy·-t- *to take* F, PMis *paṭy·-.

HOLE (in ground). Mins ṣol·a C, Mip ?ól·a- PMie *?ól·a-. Cf. Miss hol·aw, hol·op; cf. also DIG.

HORN. Miss, Mics, Mins kil·i-, PMis *kil·i-; Mip kíl·i-, PMie *kíl·i; Mil kíl·i, PMi *kíl·i.

HOUSE (1). Miss haŋ·i-, Mics haŋ·i- B, haŋí·- F, Mins haŋi-, PMis *haŋ(·)i-; Mip hané·pu-, PMie *haŋ(·)i/e... .

HOUSE (2). Miss koca-, Mics kocá·- F, Mins koca-, PMis *koča-.

HOW. Mip hí·ti- ?, Mil hín-ti, PMi *hi... .

HUMMINGBIRD. Miss, Mics, Mins li·ci·ci- C, PMis *li·či·či-.

HUNT, TO. Mics mój-ki- *to find game* F, Mil mój-ih, PMi *moj-.

I (independent pronoun). Miss kan·i- ~ kan·-, Mics kán·i- ~ ká·n ~ kany·- F, Mins kan·i- F, PMis *kán·i- ~ *ka·$_1$n$_1$-; Mip kán·i-, PMie *kán·i- ?; Mil kán·i, PMi *kán·i ?

INDIAN (1). Miss mi·wy- *body*, Mins mi·wy-k *people* ?, PMis *mi·w-; Mip mí·w- PMie *mí·w-; Mil mí·w *husband*, PMi *mí·w.

INDIAN (2). Miss, Mics, Mins míw·y- F, PMis *miw·y-; Mil míw·-ak *to marry a man*, PMi *miw·-.

INTESTINES (1). Miss putkal, Mics putkal- B, puṭkaly- F, Mins putkal-, PMis *putkal-; Mil púluk, PMi *pu(t)k$_1$al$_1$.

INTESTINES (2). Miss po·tol *rectum*, Mip púttul, PMie *pV·$_1$t$_1$Vl-. Cf. *intestines* (1).

JACKRABBIT. Miss, Mics, Mins ʔepla·li-, PMis *ʔepla·li-; Mip ʔepá·li-, PMie *ʔep(l)á·li-.

JUMP, TO. Miss tuja·ŋ-, Mics ṭuja·ŋ- F, Mins tujá·ŋ- C, tyja·ŋ-, ṭuja·ŋ- F, PMis *t/ṭuja·ŋ-; Mip táks-e-, Mil tik-ú·ṭi.

KIDNEY. Mics páspasy- F, Mins pàṣpáṣ- C, PMis *paṣpaṣ-; Mip páspas., PMie *páṣpaṣ-.

KILL, TO. Miss jo·h-, Mics jo·ṣ- *to proceed to do* F, Mins jó·s- *to proceed to do* F, PMis *jo·š-.

KNEE. Miss, Mics, Mins hoŋ·oj-, PMis *hoŋ·oj-; Mip hó·noj, PMie *hóZnoj-.

LANGUAGE. Miss liwa- *word*, Mics liwá·- F, Mins liwá·- *to speak* F, PMis *liwa·-.

LEAF. Miss, Mics, Mins tat·a-, PMis *tat·a-.

LEG. Miss ho·con *lower leg*, Mics ho·con-, PMis *ho·čon-.

LIGHTNING (1). Miss wile·pa-, Mics wilé·p- *to flash* F, Mins wil·ép- C, PMis *wil·$_1$e$_1$p... .

LIGHTNING (2). Miss wyli·p- *to flash*, Mip wúl?èp, PMie *wVl...p-.

LIPS. Mins wipe·liṣ- B, wepe·liṣ- C, Mip wypé·lis-, PMie *wVpé·lis- ? Cf. Mil léwlew.

LIVER. Miss, Mics, Mins kyl·a-, PMis *kyl·a-; Mip kýl·a-, PMie *kýl·a- ?; Mil kúl·a, PMi *kýl·a ?

LIZARD. Miss hak·aṭwi-, Mics ṣak·aṭi- F, Mins ṣak·eṭi- B. sàk·iṭí- C, PMis *šak·Vṭ-(w)i-; Mip sàk·iṭí-, PMie *šak·Vṭ(w)i-.

LOUSE, BODY. Miss sypsi-, Mics, Mins cypṣi- B, cýpsi- C, PMis *čypṣi-; Mip cópsi-, PMie *čýpṣi-; Mil cúpṣe, PMi *čýpṣi/e. Consonantal assimilation is postulated in Miss.

LOUSE, HEAD. Miss, Mics, Mins ket·y-, PMis *ket·- ?; Mip ké·n, PMie *kéZt/n- ? *kent- ?; Mil ké·t, PMi *keZt/n ? *kent ?

LUNGS. Miss pohkal, Mics póṣkaly- F, Mins pohkal- C, PMis *poškal- ?; Mip póhkal, PMie *póškal- ?; Mil póṣ·ol, PMi *póškal ? It is postulated that Mins and Mip have borrowed from Miss, and that *-šk- has assimilated to -ṣ·- in Mil. It is possible, however, that the Mics form is derived from PMis *póhkal- by analogy with PMis *wyški- HEART, q.v.

MAGIC. Mip ʔú·ten, Mil ʔúṭel, PMi *ʔu... . Cf. Mics hú·se- *to wish, to perform magic*, ʔuté·n- *to relate myths* F.

MAGPIE. Mins ʔac?ac- C, Mip ʔác?ac, PMie *ʔáč?ač-.

MAIDEN. Miss, Mics, Mins lupu-, PMis *lupu-.

MAN. Miss, Mics, Mins naŋ·a-, PMis *naŋ·a-; Mip ná·na-, PMie *náZŋa-.

MANZANITA (1). Miss, Mins ʔe·je-, PMis *ʔe·je-; Mip ʔé·je-, PMie *é·je-.

MANZANITA (2). Mics ʔej·e- F, Mip ʔéj·e- *hunting manzanita*, PMie *ʔéj·e-; Mil *éj·e, PMi *ʔéj·e.

MEAT. Mins C, Mip húk·u-, PMie *húk·u-; Mil ṣúk·i, PMi *Cúk·V.

MOON. Miss, Mics, Mins kome-, PMis *kome-; Mip komé-, PMie *komé-; Mil kóme-, PMi *komé-.

MORTAR. Miss so·se-, Mics co·se-, Mins co·ṣe-, PMis *čo·ṣe-; Mip có·se-, PMie *čó·ṣe-. In Miss, consonantal assimilation is postulated.

MOSQUITO. Mics, Mins ʔyjy·kyṣ-, PMis *ʔyjy·kyš-; Mip ʔəjó·kəkəh, PMie *ʔyjý·ky(ky)š-.

MOTHER. Miss ʔyta-, Mics ʔyta- B, ʔytá·- F, Mins ʔyta- B, ʔytá·- F, PMis *ʔyta·-; cf. Mip ʔýk·a-, Mil ʔúnu. Cf. also BROTHER.

MOUNTAIN LION. Miss hi·li·ca-, Mics hí·lica- F, PMis *hi·li(·)ča-.

MOUTH. Miss, Mics, Mins ʔaw·o-, PMis *ʔaw·o-.

MUSHROOM. Mins huŋe- C, Mip húne-, PMie *húŋe-. Cf. Miss hel·i-. In Mip, this morpheme forms a minimal pair with *fog* (q.v.) and establishes stress as phonemic in PMie and presumably in PMi.

NAME, TO. Miss, Mics F, Mins ʔoj·a- C, PMis *ʔoj·a-; Mip ʔów·a, PMie *óC·a-; Mil ʔój·a *friend* (?), PMi *ʔóC·a ?

NIGHT. Miss, Mics, Mins kawy·l-, PMis *kawy·l-; Mip káwyl, PMie *kawý·l-; Mil káwul, PMi *kawý·l.

NINE. Mics, Mins woʔe- C, PMis *woʔe-; Mip wòʔé-, PMie *woʔé-.

NO (1). Miss ʔewy·t- *to not find*, Mics ʔéw·yty- F, Mins ʔèw·ýt- C, PMis *ʔew·$_1$y$_1$t-.

NO (2). Mip hé·la-, Mil hél·a, PMi *héZla.

NOSE (1). Miss, Mics nito-, PMis *nito-.

NOSE (2). Mins huk·u-, Mip hú·k, PMie *húZk-; Mil húk, PMi *húZk. Cf. Mics huká·-j- *to smell* F.

OAK, BLACK. Miss tele·li-, Mics tele·li- B, ṭelé·li- F, Mins tele·li-, PMis *tele·li-; Mip telé·li-, PMie *telé·li-.

OAK, LIVE. Miss, Mics sa·sa- Mins ṣa·ṣa-, PMis *ṣa·ṣa-; Mip sá·sa- ?, PMie *ṣá·ṣa-; Mil ṣá·ṭa, PMi *ṣá·ṭa ? It is assumed that consonantal assimilation has taken place in Mie.

OAK, WATER. Miss wil·ih, Mics wil·iṣ-, Mins wil·i·ṣ-, PMis *wil·i(·) š-.

ONE (1). Miss, Mics keŋ·e-, PMis *keŋ·e-; Mip kèn·áṭ-, PMie *keŋ·... ; Mil kén·e, PMi *keŋ·... .

ONE (2). Miss lu·ti- *different*, Mics lu·ṭi- *different* F, Mins lut·i-B, F, lú·ti- C, PMis *lu·$_1$t$_1$i- ?

OWL (1). Mins tuk·u·li-, Mip tùk·úl·i-, PMie *tuk·ú·$_1$l$_1$i-; Mil túk·uli, PMi *tuk·ú-(·$_1$)l$_1$i.

OWL (2). Miss huh·umi-, Mics ṣuk·umi-, PMis *šuk·umi- ? Consonantal assimilation is postulated in Miss.

PACK BASKET. Miss, Mics, Mins ci·kele- C, PMis *čí·kele-; Mip cí·kel, PMie *čí·kel... ; Mil cík·il, PMi *čí·$_1$k$_1$el... .

PESTLE, Miss, Mics, Mins kawa·ci-, PMis *kawa·či-

PINE, BULL. Miss, Mics sak·y-, Mins ṣak·y-, PMis *ṣak·y-; Mip sák·y- *pine nut*, PMie *ṣak·y-.

PINE CONE. Mins ʔèl·á·ci- *green pine nut* C, Mip ʔèl·á·ci-, PMie *ʔel·á·či-.

PIÑON. Miss saŋ·ak *sugar pine*, Mics saŋ·ak- *sugar pine*, Mins ṣaŋ·ak-, PMis *ṣaŋ·ak-; Mip sán·ak- *soft-shelled pine nuts*, PMie *ṣáŋ·ak-; Mil ṣának, PMi *ṣáŋ(·)ak.

PITCH. Miss ju·tu- *pine pitch, chewing gum*, Mip jú·tu-, PMie *jú·tu-; Mil jút·e, jú·te *to chew*, PMi *jú·t... ?

PLAY, TO. Miss, Mins ʔaw·i- F, PMis *ʔaw·i-; Mip ʔá·wi-, PMie *ʔáZwi-. Cf. Mics ʔawí·n- F.

POISON OAK. Miss nykys, Mics nyky·s-, Mins nyky·ṣ-, PMis *nyky·ṣ-; Mip nókəh, PMie *nyký·ṣ-.

PROPHET. Miss hu·nih *God*, Mil hu·nih, PMi *hu·niš; cf. Mics hu·še- *to wish, to perform magic*, húš·e·pi- *water spirit* F. Final *š is reconstructed because *h does not otherwise occur in final position.

QUAIL (1). Miss, Mics, Mins kuj·ak·a-, PMis *kuj·ak·a-.

QUAIL (2). Miss, Mics hek·e·ke-, Mins hek·eke-, PMis *hek·e(·)ke-.

QUEEN (female tribal officer). Mics má·jyŋy- F, Mip maj·én, PMie *ma·$_1$j$_1$V̂ŋ-; Mil má·jen, PMi *ma·$_1$j$_1$V̂ŋ.

QUIT, TO. Mip mý·na, Mil mú·ʔen *to end*, PMi *mý·-. Cf. Miss mulha-.

RAIN. Miss, Mics, Mins nyk·a-, PMis *nyk·a-.

RAT. Miss, Mics, Mins lol·ok- C, PMis *lol·ok; Mip lòl·óko- PMie *lol·ók-; Mil ṣolók·on (?), PMi *ṣol(·)ók...? Consonantal assimilation is postulated in Mie.

REST, TO. Miss tyj·e- *to sleep*, Mics ṭyj·e- *to sleep* F, PMis *t/ṭyj·e-; Mil túj-en, PMk *t/tyj... .

RIVER. Miss wakal *creek*, Mics waká·ly- F *creek*, Mins waka·l-, PMis *waka·l-; Mip waká·ce-, PMie *waká·... ; Mil wúw·e, -wuwe.

ROBIN. Miss wít·ap, Mics wiṭ·apy- F, PMis *wit·ap- ?; Mip wít·ap, PMie *wít·ap-; Mil wíṣ·ap, PMi *wíC·ap.

ROCK. Miss hawa-, Mics ṣaw·a-B, ṣawá·- F, Mins ṣaw·a-, PMis *šawa- ?; Mip sawá·-, sówa-, PMie *šawá- ?

ROOT. Miss, Mics wi·meja-, Mins wi·mej-, PMis *wi·mej... .

SALMON. Mins tukú·n- C, Mip túkun, PMie *tukú·n-; Mil to·kuni *hard mouth* (?).

SALT. Miss, Mics, Mins koj·o-, PMis *koj·o-; Mil kój·o, PMi *koj·o.

SAND. Miss, Mics wiskala-, Mins wiṣkala-, PMis *wiṣkala-.

SAY, TO. Miss kac·-, Mics F, Mins kác·y- F, PMis *kač·-; Mip kác·-, PMie *káč·-; Mil káṣ·a, -kaṣa, PMi *ká... .

SEE, TO. Miss hyj-ŋe-, Mics ṣyj-ŋe- F, PMis *šyj-ŋe-; cf. Mip čí·se-.

SEEK, TO. Miss welh-, Mics wél-ṣy- F, PMis *wel-š-; Mip wélaj *eye*, PMie *wél... .

SEVEN. Mics, Mins kenek·ak-, PMis *kenek·ak-; Mip kenék·ak, PMie *kenék·ak-.

SHOOT, to. Miss tyk·-, Mics ṭýk·y- F, PMis *tyk·- ?; Mil túw-en, PMi *ty... ?

SHOULDER. Miss mej·el-ki-, Mics mej·el-, Mins mej·el-, PMis *mej·el-; Mip mé·ta- PMie *meZ... ?.

SHOUT, TO. Miss kaw-ŋe-, Mics káw-ŋe- F, Mins kaw-ŋe- C, PMis *kaw-ŋe-; Mip káw-, PMie *káw-.

SISTER, OLDER. Miss, Mics, Mins te·te-, PMis *te·te-; Mip tí·ka-.

SISTER'S HUSBAND. Miss, Mics ka·wy-, PMis *ka·w-; Mil káw-ko, PMi *ka·w-.

SIT DOWN, TO. Miss, Mics ṭo?-ŋe- F, PMis *ṭo?-ŋe-.

SIX. Miss, Mics tem·ok·a-, Mins tem·ok·a-B, tem·uk·a- F, PMis *tem·ok·a-; Mip temé·pu-, PMie *tem... .

SKIN. Mics talka- B, ṭálka- F, Mins tálka- C, PMis *talka-; Mip tálka-, PMie *tálka-.

SKUNK. Miss, Mics his·ik-, Mins hiṣ·ik-, PMis *hiṣ·ik-; Mip hís·ik, PMie *híṣ·ik-.

SKY. Miss li·le- *up*, Mics li·le- *up* F, Mins lí·le- C, PMis *li·le-; Mil lí·li ~ lí·le *up*, PMi *li·le-.

SLEEP, TO. Mip ?é·c-, ?éc-, Mil ?é·c ~ ?éc-, PMi *?é·č, *?éč-.

SMOKE (1). Miss hak·isa-, Mics hak·iṣ- B, hák·isa- F, Mins hak·iṣ-, PMis *hak·iṣ... .

SMOKE (2). Mip ká·lih hazy, kálsi? *is smoking*, Mil ka·l *smoke from a fire*, PMi *ká·1... .

SMOKEHOLE. Miss, Mics ka·pu- F, PMis *ka·pu-. Cf. SMOKE (2).

SNOW. Miss, Mics, Mins ke·la-, PMis *ke·la-; Mip ké·la-, PMie *ké·la-. Cf. COLD (2).

SOMEONE. Miss mana-, Mics maná·- Mins maná·- F, PMis *mana·-; Mip man-, PMie *man... ; Mil man-ti-, PMi *man... .

SON. Mics F, Mins ?aŋsi- C, F, PMis *?aŋsi-.

SOUR. Miss makmak-·e-, Mins makmak- C, PMis *makmak-; Mip mákmak, PMie *mákmak-.

SOUTH. Miss, Mics cym·e-c F, Mins cym·y-c ?, PMis *cym·V-c.

SPIDER. Miss, Mins pok·um- C, PMis *pok·um-; Mip pók·um, PMie *pók·um-; Mil pók·on, PMi *pók·VN.

SPREAD OUT, TO. Miss mola·p- *to prepare acorns*, Mics mól-pa- *to spread out acorns* F, PMis *molp$_{ia_1}$(·)-.

SQUIRREL. Miss, Mics, Mins me·we-, PMis *me·we-; Mip me·wé-, PMie *me·we-.

STAND, TO (1). Miss hac·i-c·y- *to be standing*, Mics hac·i-c·y- F, Mins hac·i-c·y·- F, PMis *hač·i-č·y-; Mip háci? *to go* (?), PMie *háč·i- ?; Mil hác·i *to stop* (trans.), PMi *háč·i-.

STAND, TO (2). Miss ha·c- *to stop* (trans.), Mil hác·ah *to stand* (of animals), PMi *hačɨ·ɨ-.

STAR. Mics hos·ok·o·na-, Mins hoṣok·ona-, PMis *hoṣ·ok·o(·)na-; Mip hòl·ók·aj, PMie *hoC·ók... .

STAY, TO. Miss, Mics F, Mins ʔuc·u- F, PMis *ʔuc·u-; cf. Mil ṣúk-uh.

STEPFATHER. Mip, Mil tá·ta, PMi *tá·ta.

STICK. Mip, Mil túmaj, PMi *túmaj.

SWIM, TO (1). Miss ʔyph-, Mics ʔýpṣy- *to bathe* F, PMis *ʔypṣ-; Mip ʔópsə-, PMie *ʔýpš-.

SWIM, TO (2). Miss ʔypyh- (Stem 2), Mip ʔəpə́h- (Stem 2), PMie *ʔypýš-; Mil ʔúp-uh, PMi *ʔýp... . In Mip, the alternate given here has so far been found only before suffixes beginning with /t/.

TAIL. Miss hu·ki-, Mics, Mins ṣu·ki-, PMis *šu·ki-. Cf. Mil kó·k.

TEARS. Mins ʔitkaj- C, Mip ʔín·aj, PMie *ʔíCCaj-; Mil ʔínte, PMi *ʔín... ?

TEN. Miss, Mics, Mins naʔa·ca-, PMis *naʔa·ča-.

THIRD PERSON. Miss, Mics F, Mins ʔis·ak- F, PMis *ʔis·ak-; Mip ʔís·y, PMie *ʔís·... .

THIS. Miss ne·-, Mics ne- F, PMis *né·-; Mip né·-, PMie *né·-; Mil né·, PMi *né·.

THOSE. Miss ʔi·k·o-, Mics ʔi·k·o- *they* F, PMis *ʔi·k·o-; Mip ʔík·o-, PMie *ʔi·k·o-; Mil ʔík·o, PMi *ʔi·k·o.

THREE. Miss tolo·-ko-, Mics tolo·-koṣ-, Mins tolo·-koṣ- B, tolo·ko-, tolo·ko-suʔ F, PMis *tolo·-ko... ; Mip tèl·ók·o-, tèl·ák·o-, PMie *tel·ɨó₁·k(·)o... ?; Mil telé·ka, PMi *tel·ɨó₁-k... . Vowel harmony is postulated in Mis and in Mil, in opposite directions.

THROAT. Miss tok·oʔla-, Mics tók·olo·la- *Adam's apple* F, Mins tok·olo·la-, PMis *tok·o...la-.

TONGUE. Miss, Mics, Mins nep·it-, PMis *nep·it-; Mip nép·it, PMie *nép·it-; Mil lét·ip, PMi *Cép₁·it₁.

TOOTH. Miss, Mics, Mins kyt·y-, PMis *kyt·-; Mip ké·t, PMie *kýZt-; Mil kút, kút·-, PMi *kýZt.

TRAIL. Miss, Mics muk·u-, Mins muk·u-t·i-, PMis *muk·-; Mip mú·k-, PMie *múZk-; Mil múk, PMi *múZk.

TREE (1). Miss, Mics la·ma-, PMis *la·ma-.

TREE (2). Miss le·ka- *white oak*, Mics lé·ka·- *white oak* F, Mins le·ka- B, *stick* F, PMis *le·ka-.

TREE (3). Mip ʔalá·wah, Mil ʔálwa, -ʔala, PMi *ʔal(a·)wa... ?

TULE. Mins líŋ·y- C, Mip lín·a-, PMie *líŋ·... .

TURTLE. Miss ʔaw·anta-, Mics ʔawán·aṭa- F, Mins ʔawán·ata- C, ʔawán·aṭa- B, PMis *awan(·a)t/ṭa-; Mip ʔawán·aj, PMie *ʔawan(·a)... .

TWO. Miss, Mics, Mins ʔoṭi·-ko-, PMis *ʔoṭi·-ko-; Mip ʔóṭ·a ? *a couple*, PMie *ʔóṭ... ; Mil ʔóṭ·a, PMi *ʔóṭ... .

UNCLE, MATERNAL. Miss, Mics ka·ka-, Mins kà·ká·-li- ? C, PMis *ka·ka-; Mip ká·ka-, PMie *ká·ka-; Mil ká·ka, PMi *ká·ka.

URINATE, TO. Mics F, Mins ʔoṭa·ŋ- C, PMis *ʔoṭa·ŋ-; Mip ʔóca?, Mil ʔóc-oh, PMi *ʔoṭ... ~ *ʔóč... ?

WAIL, TO. Mics jalá·k- *to wail for the dead* F, Mil jalá·k-uṭe *to holler*, PMi *jala·k-.

WALK, TO. Miss, Mics wy·n- F, PMis *wy·n-; Mil wícaj *to step* (?), PMi *wy... ?

WATER. Miss, Mics, Mins kik·y-, PMis *kik·-; Mip kí·k, PMie *kíZk; Mil kí·k, kik·-, -kik, PMi *kíZk.

WE. Miss mah·i-, Mics más·i ~ má·ṣ ~ maṣi- F, Mins mas·i- F, PMis *maš·i-; Mip más·i-, PMie *máš·i-; Mil ma-, PMi *ma... .

WEST. Miss, Mics ʔolo·wi-n F, Mins ʔolo·wi-t B, ʔolow·i-t C, PMis *ʔolo·wi- ?; Mil ʔoló-m-wali, PMi *ʔolo... .

WHICH. Mip ʔeké·-, Mil ʔeké· *where*, PMi *ʔeké·.

WHISKERS. Mins C, Mip musú·pel, PMie *musú·pel-.

WHISTLE, TO. Miss, Mics kuja·k- F, PMis *kuja·k-; Mil hu·jak, PMi *Cu(·)ja(·)k.

WIFE'S BROTHER. Miss wok·oli-, Mics, Mins wokli- C, PMis *wok(·o)li-; Mil wóko *elder sister* (?), PMi *wok... ?

WILDCAT. Miss, Mics, Mins tol·om·a- C,

PMis *tol·om·a-; Mip tol·óm·a-, PMie *tol·óm·a-; Mil tóleh, PMi *tol... .

WIND. Miss hena- *voice*; *air*, Mics, Mins hena-, PMis *hena-; Mip héna-, PMie *héna-.

WINTER. Miss ʔumcu-no-n, Mics ʔúmcu- F, Mins ʔúmcu- C, F, PMis *ʔumču-; Mil ʔúmcu, PMi *ʔumču.

WOMAN. Miss ʔoh·a-, Mics, Mins ʔoṣ·a-, PMis *ʔoš·a-; Mip ʔəsə́·ʔə (?).

WOODPECKER. Miss palaṭ·aṭa-, Mics palát·ata- F, PMis *palat/ṭ·at/ṭa-; Mip paltíʔna- PMie *pal... .

WORM. Miss ke·hu-, Mics ke·ṣu-, PMis *ke·šu-; Mip ké·sə-, PMie *ké·šV-.

WORMWOOD. Mip kə́cən, Mil kíc·in, PMi *kýč(·)yn?

YES. Miss hy·ʔy·, Mip hə́·ʔə, PMie *hý·ʔy... ; Mil ʔú·(h).

YOU, SINGULAR. Miss mi- ~ mi·n-, Mics mí·ni·- F, Mins mi- F, PMis *mi... ; Mip mí-, PMie *mí-; Mil mi- *you sing., obj, prefix*, PMi *mi-.

YOUTH. Miss, Mics sali-, Mins ṣali-, PMis *ṣali-; Mip sáw·e- *man*, sásti- *son*, PMie *ṣa... .

SOME REVISIONS OF PROTO-OTOMI CONSONANTS

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0. Introduction
1. Revision of phonemic inventory
2. Revision of postulated phonetic characteristics
3. Revision of clusters
4. Summary
5. Appendices A and B

0. In 1950 an article by Stanley Newman and Robert Weitlaner was published in this journal in which they reconstructed the phonemes of Proto-Otomi,[1] having carefully tabulated uniform lists of 450 words for eleven dialects. Early in my comparative studies in 1954 I read their article and at first thought my study would be unnecessary. But I had at my disposal data from three dialects of Otomi which gave additional information about the phonology and morphology, based on analyses made over a period of years by colleagues of the Summer Institute of Linguistics.[2] Furthermore, these dialects represented three of the four main dialect groups determined in the Newman-Weitlaner study. San Gregorio (SG) in the State of Hidalgo represented the Northeastern group. Tlacotlapilco (TL) in the State of Hidalgo represented the Northwestern group. San Felipe (SF) in the State of Mexico represented the Southwestern group. Though I had no data from Ixtenco, the fourth group established by Newman and Weitlaner, I had limited material from a number of other Otomi towns which provided a check on my conclusions. As I worked through my data I concluded that some of the reconstructions postulated by Newman and Weitlaner were not necessary. I also noted some systematic features in the patterning of consonant clusters which they had not pointed out. In this paper I would like to suggest some revisions of their consonant reconstructions and to point out certain features of the consonant system.

1. The phonemic inventory may be revised by the deletion of *č, *s, *ñ, and *r, thus reducing the total of consonant phonemes from 20[3] to 16. For a tabulation of proto-consonant phonemes comparing my reconstruction with theirs see appendix A.

1.1 The phoneme *č need not be reconstructed in that present day č may be considered to have developed (1) from *š pre-

[1] Stanley Newman and Robert Weitlaner, Central Otomian I: Proto-Otomi Reconstructions, IJAL 16.1–19 (1950). Otomi is part of the Otomian language family of Central Mexico. Otomi and Mazahua are classified as Central Otomian. Matlatzinca and Ocuilteco are classified as Southern Otomian. Pame and Chichimeca are classified as Northern Otomian.

[2] I wish to thank the following people of the Summer Institute of Linguistics who furnished me with data: Joyce Jenkins and Katherine Voigtlander for data from San Gregorio, Harwood and Pat Hess for data from Tlacotlapilco, and Henrietta Andrews for data from San Felipe. I am grateful to Donald Sinclair and Ethel Wallis for supplementary data on other dialects of the Mezquital Valley, and to Richard Blight for data from San Nicolas in the Northeastern dialect area.

Questionnaires filled out for the three dialects included a word list of 200 nouns and 250 verbs and a number of general questions about the phonological and morphological structures. Further information has been solicited over a period of time about the noun and verb affixes and certain particles.

Robert Weitlaner of the School of Anthropology in Mexico City has read various stages of the manuscript, making valuable suggestions and encouraging me in my comparative studies.

[3] Newman and Weitlaner in their footnote 9 interpret k^w as a unit phoneme, which brings their phoneme inventory to 20 consonant phonemes.

ceded by the morpheme *n-, or (2) from *c in the diminutive speech style.

1.1.1. In the majority of the cases where č appears in the cognate sets, it may be considered to have developed from *n-š. Note that for the following words Newman and Weitlaner have reconstructed alternate forms, one with *č and one with *š: *čuni *eagle* (60) compared with *šuni *eagle* (257); *čopho *harvest* (61) compared with *šopho *harvest* (269). Though Newman and Weitlaner do not reconstruct two forms for *girl*, they list Zim čųci *girl* in the cognate set from which they reconstruct *ču, *čų *female* (62) which contrasts with their reconstruction *šųci *girl* (273). My data show an initial n in two of the three words under discussion: TL nšuni, SF nčhuni ~ nšuni *eagle* and TL nšųci *girl*, but TL and SF šopho *harvest*.

The alternation between č and š could be accounted for on the following hypothesis: In an earlier stage of Otomi there were paradigmatic forms of nouns as well as verbs. Nouns with root initial *š also had a form which was preceded by the morpheme *n-. It is immaterial at this point to know the meaning[4] of the morpheme except to note that the distinction indicated by it was lost with the result that present day dialects demonstrate descendants of both forms. Where the *š form survived, the reflexes of *š have consistently been š. Where the *nš form survived the *n- has conditioned the development of č in some cases.

In the case of the word for *eagle*, the *š form survived in IXT, Lop, and Til, the dialects from which Newman and Weitlaner reconstruct *šuni. The *nš form survived in TL nšuni. The *n- conditioned the development of č in SF nčhuni ~ nšuni. The *n- has been lost after the č developed in Tep, Zim, and Magú čuni.

Likewise, the Newman-Weitlaner reconstruction *šųci *girl* (273) represents the survival of the *š form. The TL form nšųci represents the survival of the *nš form. The SF vocative čhų *girl* and the Zim čųci represent the survival of the *nš form, the *n- having conditioned the č before becoming lost.

The fact that TL and SF do not have initial n in their forms for *harvest* may be explained by the assumption that in the proto-language there were two competing forms which survived somewhat sporadically in the various dialects. It might also be noted that *harvest* occurs as both noun and verb. The noun is chopho in SF and sopho in TL while the verb is šopho as shown above. There is a possibility that the N-W data do not distinguish between the noun and the verb.

Newman and Weitlaner have reconstructed *č also in their reconstruction *šinči *lungs* (263). Compare my cognate set for *shoulder*: SG šiši, TL ši?ši, SF nši?nši, and San Cristobal[5] čhį?čhį. (*Lungs* and *shoulder* may have been expressed by the same morpheme in Proto-Otomi.) The occurrence of č in this cognate set may be accounted for on the above hypothesis, namely the development of č from *š after *n.

1.1.2. In a very restricted number of words where č appears in the cognate sets, it may be considered to have developed from *c. Here again the source is hinted at by alternate reconstructions of certain morphemes, this time showing an alternation of č with c. Newman and Weitlaner reconstruct *ču, *čų *female* (63) with alternate reconstruction *cu, *cų *female* (55). They list čuyo *female dog* under their reconstruction 63 and cų?yo and cųyo *female dog* under their reconstruction 55. Similarly, they list čuču *grandmother* under 63 and cu and tącu *grandmother* under 55. They reconstruct *ci *small* (53) which corresponds to the first syllable of čič?ɯ *little* which they

[4] There are in the present day Otomi dialects several nasal morphemes marking reflexive action, stative being, derivation, etc.

[5] San Cristobal is a town in the municipio of Toluca, State of Mexico, where Henrietta Andrews and I took a word list in 1953. It is in the Southwestern dialect area.

list under *č?ʉ. My data for SF show alternate forms čič?ʉ and cic?ʉ *little*.

These data may be accounted for on the following hypothesis: Some words with *c had an alternate form with č due to a diminutive style of speech in which all the sounds were retroflexed. This style of speech is still active in SF where a word like zɛšthi *shoe* is pronounced [žɛ̨šthi] when talking to a small child. In this word, and in most of the words used in this style of speech, no phonemic change is involved. However, in the case of *c going to č, in SF and in several other dialects in the area the form spoken in this speech style became inseparably attached to a few words like *little* and *grandmother*, involving the development of phonemic č.

In SF the two sources of the present day č phoneme are marked by the presence or absence of aspiration. Where č has developed from *nš it is aspirated: čhų *girl* from *nšųci. Where č has developed from *c it is unaspirated; čuhču *grandmother* from *cucu.

1.2. The phoneme *s need not be reconstructed in that present day s may be considered to have developed from *c in certain dialects represented by SG and to have developed from *ch in certain other dialects represented by TL.

	*c	*ch
SG	s	sh
TL	c	s
SF	c	ch

Where s appears in the SG reflex in a cognate set it corresponds to c in TL and SF reflexes. Note my cognate set 11: *cibi *fire*: SG sipi, TL cibi, SF cibi.

Where *s* appears in the TL reflex in a cognate set it corresponds to SG sh and to SF ch. Note my cognate set 24 *chųni *nixtamal*: SG shųni, TL sųni, SF chųni. The Newman-Weitlaner reconstructions *saha *finger* (246), *sęi *pulque* (247), and *sųni *nixtamal* (248) represent this latter set of correspondences according to my data.

1.3. The phoneme *ñ need not be reconstructed in that present day ñ may be considered to have developed from (1) *y before nasalized vowels or (2) the cluster *ny.

	*y(V)	*y(Ỹ)	*ny
SG	y	y	ny
Tl, SF	y	ñ	ñ

My cognate sets 9 and 10 illustrate source (1) *y before nasalized vowels by contrasting the reflexes of *y before nasalized and oral vowels. Before nasalized vowels *y has the reflex y in SG, but has reflex ñ in TL and SF. Before oral vowels *y has the reflex y in all dialects. 9 *yą *head*: SG yą, TL ñǫšų, SF ñą. 10 *yoho *two*: SG yoho, TL yoho, SF yoho.

My cognate set 43 illustrates source (2) *ny. The word means *two reales*, being composed of the morpheme *yo *two* (see set 10), tomin *real* (old Spanish loan), and *n- which marks derivation. 43 *nyo(tomi) *two reales*: SG nyotomi, TL ñodmi, SF ñodomi.

The Newman-Weitlander words illustrating the *ñ they reconstruct, with the exception of their set 233, show a nasalized vowel following their reconstructed ñ, indicating source (1) *y(Ỹ). Their reconstruction *ñuni *noise* (233) does not occur in my data, but I propose that it represents source (2) *ny. Accordingly, I assume that the word for *noise* derives from *yuni *to make noise* by the addition of a derivative morpheme *n-. In SF there is a verb yuni *to give off an odor*, which may well be a descendant of the postulated *yuni.

Their cluster *hñ I interpret as either *hy(Ỹ) or *nhy. 28 *hyų *three* (N-W *hñų): SG hyų, TL hñų, SF hñų. 54 *nhyʉ *heavy* (N-W *hyʉ): SG nhyʉ, TL-SF hñʉ, SC[6] hyʉ. The SC form is cited here because the nasal morpheme is absent, further demonstrating the difference between the two sets of correspondences.

[6] Santa Clara is a town in the municipio of San Bartolo Morclos, State of Mexico, in the Southwestern dialect area bordering on the Northwestern area.

Their cluster *ʔñ I interpret as either *ʔy(Y) or *nʔy. 35 *ʔyų *road* (N-W *ʔñų): SG ʔyų, TL ʔñų, SF ʔñų. 53 *nʔyoni *dry* (N-W *ʔyotʔi): SG nʔyoni, TL ʔñotʔi, SF ʔñoni.

1.4. The phoneme *r need not be reconstructed in that present day r may be considered to have developed from *n.

1.4.1. Present day r occurring in word initial position is always in a cluster with ʔ and corresponds to ʔd in the other dialects; compare my cognate set 11 *ʔnaʔyo *new* (N-W *raʔyo): SG ʔdaʔyo, TL ʔraʔyo, SF ʔdaʔyo. The cognate sets in which Newman and Weitlaner have r as distinct from ʔr were incorrectly recorded. The set of correspondences ʔd:ʔr:ʔd may be considered to have developed from the cluster *ʔn on the following considerations:

(1) It is unlikely that ʔd:ʔr:ʔd are reflexes of a cluster *ʔd because *d never has a voiced reflex in SG unless it be in this case. See **2.1** for phonetic characteristics of the two series of stops in Proto-Otomi.

(2) There is basis for reconstructing ʔd:ʔr:ʔd as *ʔn, even though ʔn never occurs as a reflex, in that voiced d is a component of *n in root syllables. See **2.2** for phonetic characteristics of nasals in Proto-Otomi. The assumption is that the ʔ in the cluster *ʔn caused the d component to become more prominent and the n component to be lost. Thus ʔd developed at an early stage, and later ʔr developed from the ʔd.

(3) The reconstruction of ʔd:ʔr:ʔd as *ʔn does not conflict with cognate sets in which present day ʔn occurs (SG nʔd: TL ʔn: SF ʔn) in that such cognate sets are morphologically divisible into a root beginning with ʔd:ʔr:ʔd and a nasal morpheme *n-. Compare the following sets: 58a *ʔnɛtʔa *ten* (N-W *rɛtʔa): SG ʔdɛtʔa, TL ʔrɛtʔa, SF ʔdɛtʔa. 58b *n-ʔnɛtʔamakutʔa *fifteen days* (*ten* and kutʔa *five* plus n- derivational morpheme): SG nʔdɛʔmahkutʔa, TL ʔnɛtʔokutʔa, SF ʔnɛtʔamakutʔa. In the reflexes of *n-ʔn, the extra layer of nasality in the derivational morpheme emphasizes the nasal component of *n so that the TL and SG reflexes have lost the d component, though it has been preserved in SG.

There is a set of correspondences ʔn:ʔn:ʔn which is rare and is limited to unstressed position and thus is in complementary distribution with ʔd:ʔr:ʔd. 72 *ʔnę *and*: SF ʔnę, SF ʔnę, SF ʔnę.

(4) The parallel reconstruction of *ʔm from SG ʔb: TL ʔm ~ ʔb: SF ʔb explains the otherwise puzzling alternation between ʔm and ʔb in TL. Assuming that *m as well as *n had an oral release before oral vowels word initially, we may further infer that the oral release was strengtehened in a cluster with ʔ. The nasal component was suppressed, as in the case of *ʔn, disappearing from the reflexes except where it appears as a free variant of ʔb in TL.

1.4.2. Present day r (not in cluster with ʔ) occurs word medially in compound words. 92 *šine *lips* (ši *covering* and ne *mouth*): SG šire, TL and SF šine. Contrast set 20 *phani *horse* (-ni is a stem-formative suffix): SG hphani, TL pani, SF phani.

Even the stem formative n becomes r in compounds where the preceding vowel has been lost. 93 *šiphani *leather* (ši *covering* and phani *horse*): SG šihphani, TL šipri, SF šiphani. 94 *ʔmandąni *cow's milk* (ʔma *milk* and ndani *cow*): SG šiʔba ntąni, SG ʔbandri.

The occurrence of r in these cognate sets may be explained as a reflex of *n under the following conditions: (1) When the root initial *n is found in word medial position in compounds in the SG dialect, the oral component of the phoneme is more prominent than the nasal component, reflecting the morpheme juncture and preserving the root initial allophone, but the oral component is flapped: SG šire *lips*. (2) When word medial *n (as in the stem-formative suffix -ni) is found in a compound where the preceding vowel has dropped out producing a cluster of stop plus n, the n has become r: TL šipri *leather* and SF ʔbandri *cow's milk*.

1.4.3. Present day r occurs in the grammar

proclitics also. Here again it may be explained as a reflex of *n but the picture is more complex. There is one set of correspondences in which all the dialects. (SG, TL, and SF) have r, sets 84 and 87. There is a contrasting set of correspondences in which TL and SF have r but SG has n, set 86.

84 *nᵠ *the*: SG rᵠ, TL ra, SF nur. 87 *nᵠ́ *his*: SG rᵠ́, TL rá, SF núr. 86 *dį *your*: SG ni, TL ri, SF nir.[7]

Data from other dialects add further light. Padre Neve y Molino (Arte del Idioma Otomi, Mexico, 1767) lists these three morphemes as na, na, and ni, respectively, not recordlng the difference in tone.[8] Similar forms occur in the dialect of Otatitlán, Vera Cruz:[9] nᵠ, nᵠ́ and ni. On the other hand the dialects of Juchitlán, Hidalgo,[10] and Tilapa, Mexico,[11] have the forms ra, rá, and di.

The line up of the patterns in the various dialects is as follows: (NM is for the dialect recorded by Neve y Molino, OT is for Otatitlán, Juch is for Juchitlán, and Til is for Tilapa.)

84 *nᵠ *the*: SG rᵠ, NM-OT nᵠ, Juch-Til ra, TL-SF ra.

87 *nᵠ́ *his*: SG rᵠ́, NM-OT nᵠ́, Juch-Til rá, TL-SF rá.

[7] The SF form in each case is the result of a coalescence of the morpheme *the*, *his*, and *your*, respectively, with the morpheme nu- *this*. The uncombined forms do not occur. The SF reflexes of the proto consonants are the same as TL and do not require separate treatment.

[8] The acute accent indicates high tone. Although tone is phonemic in Otomí it has been ignored in the reconstruction of the segmental phonemes. Here, however, we have a tone pair with *the* and *his*, making it desirable to indicate the tone. Donald Stewart of the Summer Institute of Linguistics has a tentative reconstruction of Otomi-Mazahua tone in manuscript form.

[9] Otatitlán, Vera Cruz, is in the Northeastern dialect area. Data are from word lists gathered by Joyce Jenkins and Vola Griste.

[10] Juchitlán, Hidalgo, is in the Northwestern dialect area. Data were recorded by the author.

[11] Tilapa, México, is in the Southwestern dialect area, but has divergent characteristics which are more like the Northeastern area. Data were recorded by the author during a brief field trip with Weitlaner in 1958.

86 *dį *your*: SG ni, NM-OT ni, Juch-Til di, TL-SF ri.

In order to account for the above data without reconstructing *r, which to me is undesirable for such restricted distribution, I reconstruct set 86 as *dį *your* in contrast to 84 *nᵠ *the* and 87 *nᵠ́ *his*. It is then necessary to postulate more than one period of sound change and to speculate as to how widespread those changes were. First I assume (1) that *n became r in pre-stressed proclitic syllables, specifically in sets 84 and 87. The sound change did not extend, however, to the dialects NM-OT or TL-SF. (2) *d became n before nasalized vowels in proclitic syllables, affecting set 86. The sound change did not extend to Juch-Til, hence their present day forms with d. (3) n in the proclitics, including both the reflexes of *n and the n developed from d, became r, affecting in some cases all three sets. The fact that the TL forms are uniform as to initial consonant, paralleling the initial n in all three forms in NM-OT, suggests they may have developed from the proto-forms to have initial n as in NM-OT and then have changed to r under sound change 3.

The three chronological stages of sound change might be charted as follows: (/ / indicates that dialect was unaffected by the sound change.)

Stage 1: *n to r

	SG	NM-OT	Juch-Til	TL-SF
84	rᵠ	/nᵠ/	rᵠ	/nᵠ/
87	rᵠ́	/nᵠ́/	rᵠ́	/nᵠ́/
86	dį	dį	dį	dį

Stage 2: *d(Ỹ) to n(V)

	SG	NM-OT	Juch-Til	TL-SF
84	rᵠ	nᵠ	rᵠ	nᵠ
87	rᵠ́	nᵠ́	rᵠ́	nᵠ́
86	nį	nį	/dį/	nį

Stage 3: *n and developed n to r (also loss of nasalization in Juch-Til and TL-SF.)

	SG	NM-OT	Juch-Til	TL-SF
84	rᵠ	/nᵠ/	ra	ra
87	rᵠ́	/nᵠ́/	rá	rá
86	/nį/	/ni/	di	ri

2. Additional details concerning the phonetic characteristics of the proto-phonemes may be posited on the basis of more complete information from Northeastern Otomi, specifically from San Gregorio. While it is granted that one cannot reconstruct with complete assurance the phonetic qualities of a language spoken at some distant point in history, nevertheless certain phonetic qualities may be inferred from the data. Furthermore, these considerations are relevant to the type of system reconstructed for Proto-Otomi.

2.1. Though I reconstruct two series of stops as do Newman and Weitlaner, my data would seem to indicate that the contrast was probably not voiceless-voiced, but rather a kind of fortis-lenis contrast in which fortis stops were characterized by a subphonemic preaspiration. The preaspirated stops are preserved in SG. They survive in word medial position in SF though the preaspiration is lost in word initial position. The preaspiration is lost in all positions in TL. Cognate sets 1 and 65 give the reflexes of *p in word initial and word medial positions, respectively. Cognate set 2 gives the reflexes of *b for word initial position. Word medial reflexes of *b are the same. 1 *pahni *shirt*: SG hpahni, TL pahni, SF pahni. 65 *khapi *to do with*: SG hkhahpi, TL xapi, SF khahpi. 2 *bøhɔi *mud*: SG pøhɔi, TL bøhai, SF bøhɔi. For examples of the reflexes of *t, *d, *k and *g, see appendix B, numbers 5, 65, 6, 14, 66, and 15.

Chart I is a chart of the reflexes of the stop consonants of Proto-Otomi.

2.2. The proto-nasals were likely phonetically complex, having an oral release, i.e. [m^b] and [n^d], at least in stressed syllables.

One indication of this is the fact that SG reflexes of *m and *n consistently have oral releases before oral vowels in word initial position. Before nasalized vowels or in unstressed position word medially there is no oral release in SG, except the compound words in which root initial n comes in the middle of the word and is a flapped r in SG. Cognate sets 8 and 4 give the reflexes of *n and *m before oral vowels. Cognate sets 20 and 3 give the reflexes of *n and *m before nasalized vowels. 8 *ne *mouth*: SG nde, TL ne, SF ne. 4 *mui *heart*: SG mbui, TL mui, SF mui. 7 *nąni *lime*: SG nąni, TL nąni, SF nani. 3 *mįn?yo *coyote*: SG mįn?yo, TL mii˙ño, SF mį?ño. Note that cognate set 7 also illustrates *n medially in the stem-formative suffix -ni.

The postulation of phonetically complex nasal phonemes for Proto-Otomi makes for a convenient and plausible explanation of the reflexes of several proto-clusters. Thus, a cluster of nasal and ? has predominantly oral reflexes, while a cluster of nasal and ? reinforced by the prefix *n- has predominantly nasal reflexes as discussed in **1.4.1.**

CHART I

	*p	*t	*k	*kʷ	*b	*d	*g	*w or gʷ
SG	hp	ht	hk	hkw	p	t	k	kw
TL	p	t	k	kw	b	d	g	w
SF	p	t	k	kw	b	d	g	w
	-hp-	-ht-	-hk-	-hkw-				
	*ph	*th	*kh	*kʷh	*p?	*t?	*k?	*kʷ?
SG	hph	hth	hkh	hkwh	...	t?	k?	...
TL	p	θ	x	xʷ	...	t?	k?	...
SF	ph	th	kh	kwh	...	t?	k?	...
						-t-		

CHART II

	*m	*n	*?m	*?n	*m?m	*n?n	*hm	*hn
SG	m(Ỵ)	n(Ỵ)	?b	?d	m?b	n?d	hm	hn
	mb(V)	nd(V)						
		-n-	-?m-	-?n-				
TL	m	n	?m/?b	?r	?m	?n	hm	hn
			-?m-	-?n-				
SF	m	n	?b	?d	?m	?n	hm	hn
			-?m-	-?n-				

Chart II is a chart of the reflexes of the nasal consonants of Proto-Otomi.

3. A revision of the consonant clusters in Otomi involves an understanding of the structure of consonant clusters in general. Otomi consonant clusters are restricted to certain elements. There is a consonant which serves as the core or nucleus of the cluster. This may be any consonant phoneme. The other elements in the cluster are either laryngeals (? or h) or nasals (m or n). These elements might be termed satellite because they assimilate to the point of articulation of the nuclear consonant and in some cases coalesce with the nuclear consonant to form one phonetic segment, as seen in the fricative reflexes of the clusters *ph, *th, *kh, and *k^{w}h in TL. The laryngeals ? and h occur sometimes before and sometimes after the nuclear consonant in the daughter languages, and fluctuate as to position in some of the dialects.

The Otomi consonant cluster may be symbolized by the formula: +(±N/? ± ?/h) + C. The two plus signs mean that a cluster must have a nuclear consonant C and at least one item from within the parentheses.[12] The item from within the parentheses may be ?, h or a nasal, or it may consist of both ? and a nasal, h and a nasal, or it may consist of two glottal stops, one preceding and one following the C. A cluster may have both ? and h in addition to the C but such clusters are rare.

Paralleling the phonological nuclear-satellite patterning of Otomi consonant clusters there is a nuclear-satellite patterning of some morphological features. Newman and Weitlaner noted, "Verbs usually occur in two or three forms, differentiated by an alternation of the initial consonant or consonant cluster."[13] Ethel Wallis described this phenomenon for Mezquital (Northwestern) Otomi as a morphological process of simulfixation,[14] that is, a fusion of morphemes rather than an affix, or infix, or even a substitution of one phoneme for another. She believes the morphology can be more accurately described as the simultaneous (from which comes the term simulfixation) addition of a morphemic component to the initial consonant of the stem. This component is one phoneme or less and in the Mezquital area is sometimes pronounced before the root consonant, sometimes afterward, and sometimes at the same time, making one phonetic segment.

The simulfixes Wallis describes are part of the tense-aspect system. Completive aspect is signaled by y (ñ before nasalized vowels) simulfixed to roots beginning with ? or h, and by a component of voicing simulfixed to roots beginning with a consonant other than ? or h. Resultant aspect is sig-

[12] This is true of stem initial clusters. In the proclitics there are several clusters with š, but no clusters with ? or h. Word medial clusters are more varied, especially in compounds.

[13] Newman and Weitlaner, op. cit. 8a.

[14] Ethel Wallis, Simulfixation in Aspect Markers in Mezquital Otomi, Language, 32.453–459 (1956).

naled by a t simulfixed to roots beginning with ʔ or h, and by ʔ or h simulfixed to roots beginning with a consonant other than ʔ or h.

In addition to the aspect markers which she describes in her article there are the hard-to-pin-down nasal morphemes which constitute an outer layer morphologically. Thus, morphologically the root initial consonant is the nucleus to which the aspect simulfixes are added in the first orbit and the derivational or reflexive nasal morphemes are added in a second orbit.

The theory behind the satellite behavior of certain consonant phonemes is the topic of an article by Eunice Pike.[15] She attributes the behavior of ʔ and h in the present day Mazatec dialects to their extremely low phonetic rank. Proto-Mazatec clusters with ʔ and h have reflexes in which the ʔ or h may have a different relative position or be completely lost. Phonetic rank, which ranks one consonant against another, is determined on the basis of the cavity in which the stricture occurs, the presence of voicing, complex stricture vs. simple stricture, relation to the front of the mouth, etc.[16] According to these criteria, glottal consonants ʔ and h rank at the bottom of the list. Nasals rank below oral consonants but above the glottal consonants.

In her Mazatec studies, however, Eunice Pike found n and š to behave as satellites even though they were not the lowest ranking member of the cluster. She explained this phenomenon in terms of the immediate constituents of the syllable[17] and labeled the determining factor subordination.

Thus, considerations of phonetic rank and consonant subordination served to explain differences in sound sequences from dialect to dialect in Mazatec.

In Otomi the differences in consonant sequences from dialect to dialect can be explained in terms of phonetic rank in part, and in part in terms of morphological layering, i.e. simulfixation. The morphological layering would correspond to the consonant subordination of Mazatec in the sense that it represents an additional criterion based on some feature of the structure of the language. In Mazatec the structural feature is still phonological, i.e. immediate constituents of the syllable, whereas in Otomi the structural feature is morphological.

In Otomi the initial consonant of the root morpheme is the nucleus of the consonant cluster in most cases, being simultaneously of highest phonetic rank. When the initial consonant of the root is not the highest ranking member of the cluster, either phonetic rank or morphological layering may determine which consonant will be subordinate. (1) Phonetic rank is the determining factor when the root initial is ʔ or h and the simulfix is t or y, even though the latter are morphologically subordinate. (2) Morphological layering is the determining factor when the root initial is ʔ or h and the simulfix is a nasal. The satellite nasal assimilates to the point of articulation (partially) of the ʔ or h, even though nasals have higher phonetic rank than glottals.

My revision of the consonant clusters includes the re-interpretation of some of the Newman-Weitlaner clusters and four new clusters reconstructed on the basis of new data.

3.1. *ʔm and *ʔn are reconstructed from sets of correspondences which Newman and

[15] Eunice V. Pike, Phonetic Rank and Subordination in Consonant Patterning and Historical Change, Miscellanea Phonetica, 2.25–41 (1954).

[16] Kenneth L. Pike, Phonetics: A Critical Analysis of Phonetic Theory and a Technic for the Practical Description of Sounds (Ann Arbor, 1943) provided the basis of phonetic rank. Eunice Pike extended the approach to establish the rank of one sound in relation to another, comparing the total ranks of all the strictures of which they are comprised.

[17] These had been described in K. L. Pike and E. V. Pike, Immediate Constituents of Mazateco Syllables, IJAL 13.78–91 (1947).

Weitlaner have reconstructed variously as *ʔb, *ʔmb, *mb and *ʔr or *r. In these clusters as I reconstruct them the nasal is nuclear and the ʔ is satellite. In accordance with the discussion above, the reflexes of the nasals are predominantly oral in stressed syllables. In unstressed syllables the nasal component of the nuclear nasal is seen in the reflexes. Cognate sets 31 and 33 give the reflexes of *ʔm and *ʔn in stressed position. Sets 71 and 72 give the reflexes of *ʔm and *ʔn in unstressed position. 31 *ʔmɛto *grandchild*: SG ʔbɛhto, TL ʔm/ʔbeto, SF ʔbɛhto. 33 *ʔna ʔyo *new*: SG ʔda ʔyo, TL ʔra ʔyo, SF ʔda ʔyo. 71 *tø ʔmi *to wait*: SG htø ʔmi, TL tø ʔmi, SF tø ʔmi. 72 *ʔnę *and*: SG ʔnę, TL ʔnę, SF ʔnę.

The Newman and Weitlaner reconstructions were based only upon the reflexes in stressed position. The diversity of reconstructions is due to limited data on the one hand and some cases of inaccurate phonetic recording on the other. The words which they reconstruct with *ʔb, *ʔmb, and *mb all represent the same set of correspondences according to my data. Their reconstructions are: *ʔbɛto *grandchild* (2), *ʔmbaši *broom* (8), *mba *milk* (168), *mbada *pitcher* (169), *mbe *loom* (170), *mbeza *crate* (171), *mbɛhñą *woman* (172), *mbɛphi *to work* (173), *mbɛpo *man's sister in law* (174), *mboi *black* (176). The initial glottal stop was not recorded in their cognate sets except in sets 2 and 8. They lacked data for set 2 which would have given a reflex with m and thus have required a reconstruction *ʔmbɛto.

The reconstruction of *ʔn instead of the Newman-Weitlaner *ʔr and *r has been discussed in **1.4.1.**

3.2. *mʔm and *nʔn are reconstructed from sets of correspondences which were not in the Newman-Weitlaner corpus, though their reconstruction *ʔna *one* (9) I would reconstruct as *nʔna *one*. These clusters are restricted to stem-initial position. In terms of the nuclear-satellite structure these clusters represent the addition of a nasal simulfix to the clusters described above in **3.1.** The effect of the satellite nasal has been a coalescence of the satellite and the nuclear nasal in the TL and SF reflexes. The nasal component of the nuclear nasal was reinforced by the satellite and the oral component was lost except in SG where the phonological layering is preserved. Cognate sets 57a and 58a give reflexes of *ʔm and *ʔn. Sets 57b and 58b give the reflexes of *mʔm and *nʔn for the same root morphemes with the addition of the nasal simulfix. 57a *ʔmui *to be*: SG ʔbui, TL ʔb/ʔmui, SF ʔbui. 58a *ʔnɛtʔa *ten*: SG ʔdɛtʔa, TL ʔrɛtʔa, SF ʔdɛtʔa. 57b. *mʔmui *manner of life*: SG mʔbui, TL ʔmui, SF ʔmui. 58b *nʔnɛtʔamakutʔa *fifteen days* (*ten and five* and derivational nasal simulfix): SG nʔdeʔmakutʔa, TL ʔnɛtʔokutʔa, SF ʔnɛtʔamakutʔa.

The Santa Clara dialect of the State of Mexico further supports the reconstruction of *ʔm and *mʔm. The SC reflex of *ʔm is an alternation between ʔm and ʔb as in TL: ʔmui ~ ʔbui *to be*. The SC reflex of *mʔm is consistently mʔ: mʔui *manner of life*.

3.3. The clusters *nʔ and *nh are reconstructed from sets of correspondences which are distinct from those which I reconstruct as *ʔn (**3.1.**) and *hn. They do not parallel any clusters reconstructed by Newman and Weitlaner. The contrasting sets of correspondences are explained through distinguishing satellite nasals and laryngeals from nuclear nasals and laryngeals. Cognate sets 33 and 26 show the reflexes of clusters in which the nasals are nuclear and the laryngeals are satellite. Set 33 is the same used in **3.1.** The reflexes of *hn in set 26 are phonetically [Nn] in all three dialects. 33. *ʔna ʔyo *new*: SG ʔda ʔyo, TL ʔra ʔyo, SF ʔda ʔyo. 26 *hnini *town*: SG hnini, TL hnini, SF hnini. Cognate sets 49 and 50 show the reflexes of clusters in which the laryngeals are nuclear and the nasals are satellite. The nasals have assimilated toward the point of articulation of the laryngeals. The nasal simulfix is not present in the SF forms. 49

*n?i *chile*: SG n?i [ŋ?i], TL ñ?i, SF ?i. 50 *nhęc?i *high*: SG nhęc?i [hęc?i], TL hñęęç?i, SF hịci.

3.4. *?t? and *?c? have been reconstructed from sets of correspondences in word medial position. Though other clusters may be reconstructed for word medial position, e.g. *šth and *št?,[18] I have chosen to mention *?t? and *?c? because they illustrate the nuclear-satellite construction in which there is a ? in both orbits.

The satellite character of the two glottal stops is shown by their absence in some of the reflexes.

Cognate sets 75 and 76 show the reflexes of *?t? and *?c?. Note that the second ? is missing in the TL and SF forms. 75. *thą?t?i *to regrind*: SG hthą?t?i, TL θǫ?ti, SF thą?ti. 76 *pɛ?c?i *to have*: SG hpɛ?c?i, TL pɛ?ci, SF pɛ?ci.

Cognate sets 73 and 74 show contrasting sets of correspondences which are reflexes of *t? and *c?. Note that the ? is missing from the SF forms. 73 *ɸt?e *to make*: SG ?ɸt?e, TL ?ɸt?e, SF ?ɸte. 74 *phɔc?i *to help*: SG hphɔc?i, TL pac?i, SF phɔci.

Where the reconstructed cluster has only one ? I assume it is in the first orbit. Thus, the SF reflexes have lost the first orbit ? of the clusters *t? and *c? in word medial position. Word initial reflexes of these clusters preserve the ?. (Appendix, sets 32 and 36.)

The TL and SF reflexes of sets 75 and 76 show a missing first orbit ?. In the case of SF the ? in the word medial reflexes had already been lost, even when there was only one ? in the cluster. The TL reflexes represent on the other hand a reduction of the number of glottal stops in the clusters *?t? and *?c?.

4. In summary, my study of data from three main dialects of Otomi has led me to suggest several revisions of the consonant reconstructions made by Newman and Weitlaner in their 1950 article. The occurrences of present day č, s, ñ, and r have been accounted for by hypotheses which trace their development from other proto-phonemes, making possible the removal of *č, *s, *ñ, and *r from the inventory of consonant phonemes. Certain conclusions have been drawn from the sets of correspondences concerning the phonetic characteristics of the proto stops and the proto nasals. Such postulated phonetic characteristics were relevant to the reconstruction of some of the consonant clusters, most notably *?m, *m?m, *?n and *n?n. The discussion of the nuclear-satellite characteristics of the consonant clusters was pertinent to the reconstruction of certain other clusters, notably *n?, *nh, *?t?, and *?c?. These last clusters were reconstructed from data which had not been available to Newman and Weitlaner.

[18] *gošthi *door*: SG košthi, TL goosθi, SF gošthi. *nk?ašt?i *yellow*: SG nk?ašt?i, TL k?aast?i, SF nk?ašti.

5. Appendix A: Tabulation of Consonant Reconstructions.

The following is a tabulation of the consonant phonemes and clusters reconstructed by Newman and Weitlaner with my own reconstructions listed below. Symbols in brackets alongside a reconstructed phoneme refer to postulated phonetic qualities of that phoneme.

I. Single Consonant Phonemes:

N-W	p	t	c[ts]		č[tš]		k	k^w	?	h
B	p[hp]	t[ht]	c[hts]		...		k[hk]	k^w[hk^w]	?	h
N-W	b	d	z				g	w		
B	b[p]	d[t]	z[ts]				g[k]	w[k^w]		
N-W	m	n	ñ	y	r	s	š			
B	m[m^b]	n[n^d]	...	y	...	...	š			

II. Consonant Clusters with *h:

N-W	ph	th	ch	kh	kʷh			
B	ph	th	ch	kh	kʷh			
N-W	hm	hn	hñ	hy	hw			
B	hm	hn	...	hy	hw			

III. Consonant Clusters with *ʔ:

N-W	...	tʔ	cʔ	čʔ	kʔ	kʷʔ		
B	pʔ	tʔ	cʔ	...	kʔ	kʷʔ		
N-W	ʔm	ʔn	ʔñ	ʔb	ʔr	ʔw	ʔy	
B	ʔm	ʔn	...	...	...	ʔw	ʔy	

IV. Consonant Clusters with *m- or *n-:

N-W	mp	nt	nc	nč	nk	...	...	...
B	mp	nt	nc	...	nk	nkʷ	nʔ	nh
N-W	mb	nd	...	ng	...	nš	ns	...
B	mb	nd	nz	ng	nw	nš	...	ny

V. Consonant Clusters with three consonant phonemes (not exhaustive):

N-W	mph	nth	nch	nkh	ntʔ	ncʔ	nčʔ	nkʔ
B	mph	nth	...	nkh	ntʔ	ncʔ	...	nkʔ
N-W	...	...	...	...	...	...		
B	nhy	mʔm	nʔn	ʔtʔ	ʔcʔ	nʔy		

Appendix B: List of Cognate Sets.

The following listing of cognate sets has been selected to illustrate the sets of correspondences for the consonant phonemes and clusters which I have reconstructed. It includes cognate sets with sets of correspondences which are positional variants of some proto-phoneme. The cognate sets are grouped in three sections: (I) correspondences in word-initial position, (II) those in word-medial position, and (III) those in proclitic position. A fourth section (IV) lists some examples of root-initial *n in compounds.

I. Sets of correspondences in word-initial position:

1. *p *pahni *shirt*: SG hpahni, TL pahni, SF pahni.
2. *b *bøhɔi *mud*: SG pøhɔi, TL bøhai, SF bøhɔi.
3. *m(Ɣ) *mịnʔyo *coyote*: SG mịnʔyo, TL miiʔño, SF mịʔño.
4. *m(V) *mɯi *heart*: SG mbɯi, TL mɯi, SF mɯi.
5. *t *tihi *to run*: SG htihi, TL tihi, SF tihi.
6. *d *dɔ *eye*: SG tɔ, TL da, SF dɔ.
7. *n(Ɣ) *nạni *lime*: SG nạni, TL nọni, SF nạni.
8. *n(V) *ne *mouth*: SG nde, TL ne, SF ne.
9. *y(Ɣ) *yą *head*: SG yą, TL ñǫšu, SF ñą.
10. *y(V) *yoho *two*: SG yoho, TL yoho, SF yoho.
11. *c *cibi *fire*: SG sipi, TL cibi, SF cibi.
12. *z *za *wood*: SG za, TL za, SF za.
13. *š *šøni *water jug*: SG šøni, TL šøni, SF šøni.
14. *k *kɯtʔa *five*: SG hkɯtʔa, TL kɯtʔa, SF kɯtʔa.
15. *g *gụi *cloud*: SG kụi, TL gụi, SF gụi.
16. *kʷ *kʷɛ *anger*: SG hkwɛ, TL kwɛ, SF kʷɛ.
17. *w *wa *foot*: SG kwa, TL wa, SF wa.
18. *h *honi *to look for*: SG honi, TL honi, SF honi.
19. *ʔ *ʔøde *to hear*: SG ʔøte, TL ʔøde, SF ʔøde.
20. *ph *phani *horse*: SG hphani, TL pani, SF phani.
21. *th *thạdi *to answer*: SG hthạti, TL θǫdi, SF thạdi.
22. *kh *khɯni *masa*: SG hkhɯni, TL xɯni, SF khɯni.
23. *kʷh *kʷha *rabbit*: SG tịnshkwha, TL xwa, SF kʷha.

24. *ch *chụni *nixtamal*: SG shụni, TL sụni, SF chụni.
25. *hm *hmị *face*: SG hmị, TL hmị, SF hmị.
26. *hn *hnini *town*: SG hnini, TL hnini, SF hnini.
27. *hy(V) *hyadi *sun*: SG hyati, TL hyadi, SF hyadi.
28. *hy(Y) *hyụ *three*: SG hyụ, TL hñụ, SF hñụ.
29. *hw *hwąhi *field*: SG hwąhi, TL hwọhi, SF hwąhi.
30. *p? *p?ʉ *there*: SG pʉ, SN p?ʉ,[19] TL pʉ, SC p?ʉ, SF pʉ.
31. *?m *?mɛto *grandchild*: SG ?bɛhto, TL ?b/?mɛto, SF ?bɛhto.
32. *t? *t?ɛi *atole*: SG t?ɛi, TL t?ɛi, SF t?ii.
33. *?n *?na?yo *new*: SG ?da?yo, TL ?ra?yo, SF ?da?yo.
34. *?y(Y) *?yụ *road*: SG ?yụ, TL ?ñụ, SF ?ñụ.
35. *?y(V) *?yʉga *neck*: SG ?yʉka, TL ?yʉga, SF ?yʉga.
36. *c? *c?øe *pot*: SG c?øe, TL c?øøye, SF c?øi.
37. *k? *k?ɛyą *snake*: SG k?ɛyą, TL k?ɛñọ, SF k?ịñą.
38. *?w *?wịni *to feed*: SG ?wịni, TL ?wịni, SF ?wịni.
39. *mp *mpidi *thick*: SG mhpiti, TL pidi, SF pidi.
40. *mb *mbøhø *foreign man*: SG mpøhø, TL mbøhø, SF mbøhø.
41. *nt *ntøge *ride*: SG nhtøke, TL ntøge, SF ntøge.
42. *nd *ndą *ripe*: SG ntą, TL dọ, SF ndą.
43. *ny *nyotomi *two bits*: SG nyotomi, TL ñodmi, SF ñodomi.
44. *nc *ncɛ *cold*: SG ncɛ, TL cɛ, SF ncɛ.
45. *nz *nzopho *to speak to*: SG nzopho, TL zopo, SF nzopho.
46. *nš *nšịdi *wide*: SG nšịti, TL nšịdi, SF nšịdi.
47. *nk nkʉhi *delicious*: SG nhkʉhi, TL kʉʉhi, SF nkʉhi.
48. *ng *ngụ *house*: SG nkụ, TL ngụ, SF ngụ.
49. *n? *n?i *chile*: SG n?i, TL ñ?i, SF ?i.
50. *nh *nhɛc?i *high*: SG nhɛc?i, TL hñɛɛc?i, SF hịci.
51. *nth *nthąti *to marry*: SG nhthąhtiwi, TL nθọti, SG nthąhti.
52. *nc? *nc?o *dirty*: SG nc?o, TL nc?o, SF nc?o.
53. *n?y *n?yoni *dry*: SG n?yoni, TL ?ñot?i, SF ?ñoni.
54. *nhy *nhyʉ *heavy*: SG nhyʉ, TL hñʉ, SC hyʉ, SF hñʉ.
55. *nkh *nkhụ *man's sister*: SG nkhụ, TL nxụ, SF nkhụ.
56. *nk? *nk?ašt?i *yellow*: SG nk?ašt?i, TL k?aast?i, SF nk?ašti.
57a. *?m *?mʉi *to be*: SF ?bʉi, TL ?b/?mʉi, SF ?bʉi.
57b. *m?m *m?mʉi *manner of life*: SG m?bʉi, TL ?mʉi, SF ?mʉi.
58a. *?n *?nɛt?a *ten*: SG ?dɛt?a, TL ?rɛt?a, SF ?dɛt?a.
58b. *n?n *n?nɛt?amakʉt?a *fifteen days*: SG n?dɛ?makʉt?a, TL ?nɛt?okʉt?a, SF ?nɛt?amakʉt?a.

II. Sets of Correspondences in word medial position:

59. *-b- *cibi *fire*: SG sipi, TL cibi, SF cibi.
60. *-d- *pądi *to know*: SG hpąti, TL pọdi, SF pądi.
61. *-n- *zoni *to cry*: SG zoni, TL zoni, SF zoni.
62. *-š- *nt?aši *white*: SG nt?aši, TL t?aši, SF nt?aši.
63. *-g- *tɔgi *to fall*: SG htɔki, TL tągi, SF tɔgi.
64. *-h- *kohi *to stay*: SG hkohi, TL kohi, SF kohi.
65. *-p- *khapi *to do with*: SG hkhahpi, TL xapi, SF khahpi.

[19] San Nicolas is in the Northeastern dialect area. Instances of p? in the present day dialects are rare and it so happens that none of the three dialects on which my study is based have the cluster p?. However, the fact that Santa Clara in the Northwestern area and San Nicolas in the Northeastern area have the form p?ʉ *there* makes me unwilling to omit it from the list of reconstructions at this point.

66. *-t- *cuti *to nurse*: SG suhti, TL cuuti, SF cuhti.
67. *-k- *thụki *to wipe off*: SG thụhki, TL θụki, SF thụhki.
68. *-ph- *maphi *to shout*: SG mbahphi, TL mapi, SF maphi.
69. *-hm- *tạhmi *to rub*: SG htạhmi, TL tạhmi, SF tạhmi.
70. *-hn- *pɛhni *to send*: SG hpɛhni, TL pɛhni, SF pɛhni.
71. *-ʔm- *tøʔmi *to wait*: SG htøʔmi, TL tøʔmi, SF tøʔmi.
72. *-ʔn- *ʔnę (unstressed clitic) *and*: SG ʔnę, TL ʔnę, SF ʔnę.
73. *-tʔ- *ʔøtʔe *to do or make*: SG ʔøtʔe, TL ʔøtʔe, SF ʔøte.
74. *-cʔ- *phɔcʔi *to help*: SG hphɔcʔi, TL pacʔi, SF phɔci.
75. *-ʔtʔ- *thạʔtʔi *to regrind*: SG hthạʔtʔi, TL θọʔti, SF thạʔti.
76. *-ʔcʔ- *pɛʔcʔi *to have*: SG hpɛʔcʔi, TL pɛʔci, SF pɛʔci.
77. *-nd- *handi *to see*: SG hanti, TL handi, SF handi.
78. *-ntʔ- *mpɛntʔi *to grasp*: SG mpɛntʔi, ... SF pɛnti.
79. *-ncʔ- *nancʔi *to arise*: SG ndancʔi, ... SF nanci.
80. *-nš- *mąnša *corn on the cob*: SG mąnša, TL manša, SF mąnčha.
81. *-ng- *pengi *to return*: SG hpenki, TL pengi, SF pengi.
82. *-šth- *gošthi *door*: SG košthi, TL goosθi, SF gošthi.
83. *-štʔ- *nkʔaštʔi *yellow*: SG nkʔaštʔi, TL kʔaastʔi, SF nkʔašti.

III. Sets of correspondences in the grammar proclitics:

84. *n *ną *the*: SG ra, TL ra, SF nur, Juch ra, NM na, Til ra.
85. *m *mą *my*: SG mą, TL ma, SF num.
86. *d *dị *your*: SG ni, TL ri, SF nir, Juch di, NM ni, Til di.
87. *n *ną́ *his*: SG rą́, TL rá, SF nur, Juch rá, NM na, Til rá.
88. *y *yą́ *their*: SG yą́, TL yá, SF yi.
89. *d *dą́ *1st per. past*: SG tą́, TL dá, SF dú.
90. *g *gą́ *2nd per. past*: SG ką́, TL gá, SF gú.
91. *b *bi *3rd per. past*: SG pi, TL bi, SF bi

IV. Sets of correspondences illustrating reflexes of root-initial *n in compounds.

92. *šine *lips*: SG šire, TL šine, SF šine.
93. *šiphani, *skin*: SG šihphani, TL šipri, SF šiphani.
94. *ʔmandąni *cow's milk*: SG šiʔba ntąni, ... SF ʔbandri.

SPANISH LOANWORDS IN WAUNANA[1]

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0. Introduction
1. Stress
2. Vowel phonemes
3. Consonant phonemes
4. Morphological adaptations
5. Summary of loanword influences
6. Dictionary of loanwords

0.1. The Waunana (Noanamá)—called Noanimá by Melendez (1861), Chocama by Hurtado (1924), and Nonamá by Wassén (1935)—is a language spoken by some 2500 Indians inhabiting the San Juan River and its tributaries south of Bebedó, the Docampadó River and its tributaries, and the Rivers Ijuá, Orpua, Pichimá, and Bongo in the Chocó of Colombia. In recent years several hundred Waunana Indians have migrated to points along the northern Chocó coast like Cúpica and Juradó, and to the Darién of Panama. The Waunana language is a member of the Chocó family, which is generally considered as belonging to the Carib language stock.[2]

0.2. The Waunana language has been in contact with Spanish speech since the early years of the sixteenth century when the conquistadores first penetrated the jungles of the Darién in their search for gold. The discovery of gold was followed by unsuccessful attempts to force the Indians to work as slaves in the gold mines. The failure in these attempts became the occasion for the introduction of Negro slave labor. These Negroes have since that time been (and are even today) the most immediate link in the chain of Spanish Waunana contacts. The heterogeneous linguistic origins of the Negroes precipitated the rapid adoption of the Spanish language as their only medium of communication.

From the presence of such relic forms, as medieval Spanish[3] agora (ahora) *now* and bide ~ bido (ví ~ vió) *saw*, which are even today heard in the speech of the oldest Negroes and Indians, we can infer that the colloquial Spanish of conquest times differed from present day colloquial Spanish. It is also highly probable that the Spanish speech of the newly hispanicized Negroes involved pertinent idiosyncrasies. However, for neither of these two conditions are there at our disposal documents by which to determine the influences they have exerted on loanword adaptations. In general, present day Negroes speak a colloquial Spanish quite comparable to that of non-Negro Colombians living in the Chocó.

[1] The materials for this paper were gathered during the years 1951–1953 while the author served as a missionary linguist in Noanamá village on the San Juan River of the Colombian Chocó. The principal informants were Alcides Chamarra, Olegario Peña, Jesusita Conquista, however many other speakers have been observed to use the loanwords under analysis. These informants, like most Waunana speaking Spanish, exhibited the peculiarity of using only the third person singular form of the verb with all subject pronouns, singular and plural.

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[2] See HSAI, vol. VI, p. 232; Paul Rivet, "La Lengua Chocó," Revista del Instituto de Etnología Nacional, vol. I, Bogotá, No. 1, 1943, pp. 137–196, No. 2, 1944, pp. 297–349; and Gerardo Reichel-Dolmatoff, "Indígenas de Colombia," America Indígena, vol. XIX, p. 648.

[3] Medieval Spanish, abbreviated MSp, forms are according to: R. S. Boggs, Lloyd Karsten, Hayward Kenniston, and H. B. Richardson, Tentative Dictionary of Medieval Spanish, vols. I and II, Chapel Hill, 1946 (Mimeographed).

0.3. This paper presents an analysis of 172 Spanish loanwords recorded in Waunana speech. It is highly probable that these words have been borrowed at different times during the period of contact. Though no specific dates can be determined, the data reveal that a greater degree of conformity to the Waunana model indicates earlier borrowing. Subjectively, informants did not classify such 'older loans' as loanwords. Today most of the Waunana men are at least partially bilingual. This condition is rapidly increasing the number of only partially assimilated loanwords. The latter in turn have already begun to affect Waunana phonemic structure.

1.1. For both of the languages in contact, stress is phonemic. For Waunana (hereafter also referred to as the primary system, or as the recipient) stress is always marked on all free forms; for Colloquial Chocó Spanish, however, (hereafter abbreviated as CSp and also referred to as the secondary system or the donor) it is marked according to the pattern of written Castillian Spanish.

2.1. CSp has five vowel phonemes: i, e, a, u, o. For each of these vowels only oral quality is pertinent. In open syllables front unrounded i, e, and back rounded o, u, occur with a close pronunciation, while in checked syllables they tend towards a more open pronunciation. Open pronunciation is most marked for front vowels. Central a in checked syllables, especially before velars, tends to occur with back quality. When occurring in unaccented position in vowel clusters high vowels i and u become nonsyllabic y and w respectively. CSp vowels do not present any pertinent distributional limits.

2.2. Waunana has twelve vowel phonemes, six oral: i, e, ï, a, u, o and six nasal: į, ę, ĭ, ą, ų, ǫ. Each series distinguishes three tongue positions: front, central and back. Rounding is concurrent with only back position. At each tongue position two tongue heights are distinguished, but both front and back vowels are articulated at relatively higher position than the corresponding central vowels. These positions are also somewhat higher than those of the corresponding CSp vowels. In open syllables front and back vowels exhibit close articulation, while in checked syllables all tend towards open articulation. As in CSp this is most marked for front vowels. Central ï is close in all positions, while a is open in all positions, but tends towards a more back position in all checked syllables, especially before velar consonants. Phonetically long vowels are treated as clusters of identical vowels. All vowels occur freely, both singly and in clusters, in word medial and word final positions. No vowels occur initially, since all Waunana words begin with a consonant. Final unstressed vowels suffer apocope in the continuum of speech according to a regular morphophonemic pattern. Under certain conditions,[4] which have as yet not been definitely identified, unstressed high vowels i and u vary freely with y and w.

2.3 The description of loanwords borrowed with a vowel quality differing from the CSp model follows.

As indicated in the description of the two vowel systems, Waunana front and back vowels are articulated in a slightly higher

[4] The w and y and their relationship to u and i offer a problem that has not lent itself to a precise statement to date because two conflicting patterns occur: they pattern as vowels in one instance and as consonants in another. Thus: per ʔau- stem of *buy* plus *purposive suffix*, -an∼n (-an after consonants and -n after vowels) becomes per ʔawan or per ʔaun *in order to buy*; kẹų *nose* plus *directional suffix* -ag (-ag after consonants and -g after vowels) becomes kʰẹwag *towards the nose*, but *kʰẹų* plus *instrumental suffix* -au∼u (-au after consonants and -u after vowels) becomes kʰẹųų. Likewise dai *here* plus -ag∼g *directional suffix* (-ag after consonants and -g after vowels) becomes dayag *towards this place*; but -dĭy *with* when verbalized employs lengthening of final vowel derivational process and becomes dĭisim *is equal*.

position than those of the CSp system. The resulting phonic interference has caused a number of CSp words containing e and o to be borrowed with i and u respectively. The following examples[5] occur: e as i: ʔañamaria- (MSp almarearse) *to be nauseated*, bentia- (ventear) *to winnow*, ʔišibokʰa- (equivocarse *to be wrong*) *to make a speech error*, martiʔéd (martes) *Tuesday*, ʔohia- (ojear) *to cast an evil eye*, palitón (paletón) *toucan*; o as u: bañedúr̃ (barredor *sweeper*) *broom*, bulikpáh (borilico) *a kind of tree*, degúlp (degolpe) *all of a sudden*, kandau (candado ~ candao) *lock*, lukʰo- ~ lukʰa- (loco *crazy*) *to become crazy*, lumía ~ lomía (lomillo *sirloin*) *loins*, negúr̃ (negro) *negro*, pulúm (plomo *lead*) *shot for shotgun*, serkáu (cercado ~ cercao *enclosure*) *wall or fence*.

CSp vowels preceding a nasal consonant often exhibit slight nasal quality. Since nasal quality is phonemic in the primary system, the conditioned nasal quality of the secondary system has been given phonemic status in a number of words. This appears to be true especially of words that have the marks of early loans. The data reveal three conditions under which words were borrowed with nasal vowel quality. In each case the nasal consonant of a VN[6] sequence was treated as a marker of a nasal vowel quality.[7]

VN preceding a homo-organic consonant is borrowed as V̨: awąt- (aguantar) *to bear, to endure*, domįgʔéd (domingo) *Sunday*, kašíp (cachimba) *pipe*, mąglebíh (mangle) *mangrove tree*, sọbéeɾ̃ (sombrero) *hat*, tąrą́p (trampa) *trap*, kąpę́ra (compañero) *companion, friend*. In the words, šį̈š (chinche) *bed bug*, tr̃į̈š (trincha) *ditch, barrier*, the two-mora length of the VN sequence of the donor has in the recipient been preserved as a phonetically long vowel [phonemically as a cluster of identical vowels].

VN in word final position is borrowed as V̨̄: botǫ́ (botón) *button*, bïtalǫ́ (talón) *heel*.

VNV of the donor is borrowed as V̨̄V̨̄: alį̨ą (aliño *spice*) *pepper*, pį̨ąhǫ́h (piña) *pineapple*.

In the latter series of examples at least two interference factors are operative. First, the absence of a palatal nasal ñ in the primary system; and second, the frequent occurrence of the ia cluster in the primary model.

Pattern pressure by the ia cluster as a factor in differing vowel quality can in addition be seen in: lumía (lomillo) *loins*, sepía (sepillo) *plane*, sentia- (sentir) *to feel*, tigría (tigrillo) *ocelet*, sarsía (sarcillo) *earring*.

However, there remains a residue of words borrowed with differing vowel qualities for which no substitution pattern has yet been observed; o as i: káši (cacho) *horn*; o as a: kąpę́ra (compañero *companion*) *friend*; u as ï: mį̈nyék (muñeca) *doll*; e as ï: ʔentʰïr (entero) *whole, complete*; a as ï ~ o: hïriéna ~ hoïriéna (arriera) *soldier ants*; a as e: sapún (espuma) *foam*, biék (viaje) *trip*; e as o and o as e: ʔieɾ̃kót (horquilla ~ horqueta) *forked stick*. There is also one word, tąrpíš (trapiche) *sugar cane press*, borrowed with nasal vowel quality, which in the CSp model exhibits no nasal.

2.4. The description of loanwords with vowel quantity differing from the CSp model follows.

There is only one example of borrowing without an initial vowel: hogaa- (ahogar) *to drown*. Word final unstressed vowels of

[5] An attempt has been made to list all examples exhaustively, but verb forms are cited only as bound stems.

[6] In formulas the following abbreviations occur: V for vowels, N for nasal, C for consonants, and R for vibrants.

[7] In the neighboring related Ẹpẹra dialects nasal continuants occurring before homorganic consonants are epenthetic manifestations of the transition from the preceding nasal vowel, as in: /ẹpẹra/ [ẹmbẹna] indian, /ą̣sá/ [ą̣nsá] day, /į̨ké/ [į̨ŋké] a bird. This phenomenon appears to have been operative also in earlier Waunana speech and is seen in older place names of Indian origin. Note modern CSp docampadó and Waunana dokʰą̣pdó *name of a river*.

the CSp model do not appear in the primary model in accordance with the Waunana morphophonemic pattern of apocope of final unstressed vowels. The examples are: ʔangóst (langosta) *locust*, ʔardít (ardita) *squirrel*, ʔarín (harina) *flour*, ʔawakát (aguacate) *avocado*, bandéer (bandera) *flag*, bařančíh (barana?) *belt*, bář (barra) *crowbar*, basúr (basura) *garbage*, batʰéh (batéa) *dish*, bél (vela) *sail*, biék (viaje) *trip*, biekʔór *traveller*, bilkóš (bizcocho) *biscuit*, bĭkláp (clavo) *athlete's foot*, botʰéy (botella) *bottle*, bulikpáh (borilico) *a tree*, šalék (chaleco) *vest*, šikʰedíh (chiquero) *pig pen*, šinšór (chinchorro) *fishing net*, šĵjš (chinche) *bed bug*, degúlp (de golpe) *suddenly*, depár (deuda) *debt*, domigʔéd (domingo) *Sunday*, dopatík (paticaˢ *little duck*) *duck*, ʔempéeh ~ ʔempéy (empella) *hide*, ʔentʰír (entero) *whole*, ʔespʰég ~ ʔespʰék (espejo) *mirror*, ʔestupʰa ~ ʔestúp (estufa) *stove*, gát (gato) *cat*, gainendíh (gallinero) *chicken house*, hář (jarra) *jar*, hiéř(hierro) *iron*, hĭřién (arriera) *ant*, hós (oso) *bear*, hueb?éd (jueves) *Thursday*, ʔintéřn (linterna) *lantern*, kabáy (caballo) *horse*, kabúy (cabulla) *string*, káš (cacho) *horn*, kašĵp (cachimba) *pipe*, kamís (camisa) *shirt*, kampán (campana) *bell*, kapšíh (cabo) *rope*, kés (queso) *cheese*, kláp ~ kaláp (clavo) *athlete's foot*, kořahég (coraje) *courage*, lunʔéd (lunes) *Monday*, lořít (loritaˢ *little parrot*) *parrot*, madřinʔųą́n (madrina) *godmother*, makín (máquina) *machine*, martiʔéd (martes) *Tuesday*, mĭnyék (muñeca) *doll*, míš (michi) *cat*, nabákʰa ~ nabák (navaja) *knife*, nąřąnhǫ́h (naranja) *orange*, páat (parte) *a part*, pʰáře (padre) *priest*, padřinhóy (padrino) *godfather*, palisád (palisada) *debris blocking river*, řąšdíh (rancho) *little hut*, patabál (tabla) *board*, pikét (tiquete) *ticket*, pwertdíh (puerta) *door*, saltdám (salto) *waterfall*, sapún (espuma) *foam*, sǫǫbéeř (sombrero) *hat*, sootík (sortija) *fingerring*, talařsiř (taladro) *drill*, tiendíh (tienda) *store*, tąrąp (trampa) *trap*, tąrpíš (trapiche) *sugar cane press*, tʰoodíh (toldo) *sleeping net*, tořpeř (torpedo) *dynamite*, třĵjš (trincha) *ditch*, yabméh (llave) *key*, wanpanhǫ́h (guanábana) *a fruit*.

A number of substantive loanwords differ from the CSp model by added vowel quantity. This may represent a compensation for consonants—linguals or nasals—present in CSp model, but absent in the borrowed form: VlC as VVC: pʰaatkʰóna (plata) *money*, tʰoodíh (toldo) *sleeping net*. VRC as VVC: sootík (sortija) *fingerring*, páat (parte) *share*: VNC as V̨V̨C: sǫǫbéer ~ sǫbéer (sombrero) *hat*, šĵjš (chinche) *bed bug*, třĵjš (trincha) *ditch*; CRV as CVV: sǫbéer (sombrero) *hat*.

A lengthened vowel is also found in the word bandéeř (bandera) flag. This added length appears to have resulted in analogy to sǫǫbéeř (sombrero) *hat*, and such Waunana forms as bebę́ę̨ř *a small turtle*.

All verbal loanwords, except gan- (ganar) *to earn, win*, ʔawąt- (aguantar) *to bear, suffer*, and pag- (pagar) *to pay* which appear minus a stem final vowel in the recipient, have been borrowed with stems ending in a vowel cluster. The stems ending in a vowel cluster in the CSp model have been normalized with an ia cluster: ʔařamaria- (almarearse) *to be nauseated*, bentia- (ventear) *to winnow*, kambia- (cambiar) *to change*, ʔohia- (ojear) *to cast evil eye*, pʰia- (fiar) *to extend credit*.

Verb stems ending in a single vowel in the CSp model have undergone two types of treatment. Some stems exhibit alternants for both types. Stems of group one have been borrowed with an ia cluster: barahia- (barajar) *to shuffle cards*, bendesia- (bendecir) *to bless*, maldesia- (maldecir) *to curse*, sentia- ~ sentii- (sentir) *to feel*. Stems of group two, which is also the most predominant, have been borrowed with a lengthened stem final vowel (phonemically treated as a cluster of identical vowels). In the Waunana model this represents a type of verb derivation as seen in: pʰářg *thickness* becoming pʰařaa- *to be thick*, ʔíurg *new*

ˢ It is interesting to note that for several words the Spanish diminutive form has been the base of the borrowed word.

becoming ʔiurii- *to be new*. Loanword examples are: ʔaldibinaa- (adivinar) *to soothsay*, ʔapostaa- (apostar) *to bet*, ʔayudaa- (ayudar) *to help*, gastaa- (gastar) *to spend*, hogaa- (ahogar) *to drown*, molestaa- (molestar) *to bother*, ponee- (poner) *to put*, prestaa- (prestar) *to borrow*, ʈondaa- (rondar) *to spy*, sentii- ~ sentia- (sentir) *to become aware of*, multaa- (multar) *to fine*, lukʰoo- ~ lukʰa- (loco) *to be crazy*, serbii- (servir) *to be useful*.

3.1. CSp[9] has 19 consonant phonemes p, t, k, b, d, g, č, ǰ, f, x ~ h, s, l, r, ř, m, n, ñ, w, y.

Stops occur in a voiceless unaspirated series and a corresponding voiced series. The latter exhibit voiced fricative allophones [β], [δ], and [γ] respectively in intervocalic position.

Affricates č and ǰ also occur as a voiceless-voiced opposition formed at alveopalatal articulation, but they are distinct from stops in that they never enter into unisyllabic consonant clusters. Before front vowels ǰ is markedly prepalatal.

Voiceless fricatives are f labiodental, s grooved dental, and x ~ h uvular or velar with slight glottal friction. The latter never occurs before consonants.

Linguals include l, a voiced dental lateral; and r, ř, voiced alveolar flaps distinguished by single and multiple taps respectively.

m, n, ñ, are voiced nasal continuants formed at bilabial, alveolar, and alveopalatal points of articulation. Before f, m is labiodental, while n is prepalatal before č and ǰ, and velar [ŋ] before velar consonants.

CSp consonants have the following distribution. All except r can occur initially before vowels; finally after vowels only d, s, l, r, n, occur; medially there are no pertinent restrictions.

3.2. Waunana[10] has twenty consonant phonemes pʰ, tʰ, kʰ, p, t, k, ʔ, b, d, g, m, n, s, š, l, ř, ṛ, w, y, h.

The three series of stops pattern as a fortis voiceless aspirated series,[11] a lenis voiceless unaspirated series, and a voiced unaspirated series with fortis articulation, which is most marked in initial position. These oppositions are operative only in initial and medial positions; they are neutralized in final position where only lenis unaspirated stops occur. They are also neutralized when fortis stops, aspirated or voiced, occur as first members in consonant clusters with voiceless consonants. In clusters with voiced consonants as second member only the fortis series is neutralized. Velar k, kʰ exhibit front or back allophones depending on the vocalic environment in which they occur. kʰ in addition exhibits a fricative [x] allophone in intervocalic position. Voiced g occurs mainly word medially.

The glottal stop is limited to word initial and medial positions.

Nasal continuants m and n occur without restriction. Alveolar n exhibits allophone [ŋ] before velar stops and h.

Spirants s and š exhibit affricated allophones [c] and [č] in syllable initial position. The former functions as a free variant, while the latter occurs in complementary distribution with [š].

Voiced lateral l occurs only in loanwords.

Linguals ř and ṛ are native, and in native Waunana words are limited to word medial and word final positions. The ř is a multiple tap trill initially and intervocalically,

[9] For the description of CSp phonemes the following sources have been consulted, but they have been followed only in as far as they describe the CSp system: Emilio Alarcos Llorach, *Fonología Española*, Madrid, Editorial Gredos, 5954; and George L. Trager, "The Phonemes of Castillian Spanish," Travaux du Circle Linguistiqué de Prague, vol. VIII, 1939.

[10] The description here follows Jacob A. Loewen, Waunana Grammar: A Descriptive Analysis, an unpublished master's thesis presented at the University of Washington in 1954.

[11] The fortis-lenis apposition in voiceless stops is characteristic of the northern four dialects of the Ẹpẹra language of the Chocó family. See An Introduction to Ẹpẹra Speech: Sambú dialect, a dissertation by the author available in microfilm.

but before consonants the trill is reduced considerably. The ɾ is a retroflexed vibrant which before consonants tends towards [ɖ], retroflexed stop, and after nasal vowels occurs as [ɳ], retroflexed nasal. Increased bilingualism has introduced [ř] from CSp which now shows some overlap or confusion with allophones of both of the native phonemes.

Semiconsonants w, y, h occur in all word positions. In syllable onsets [w] may vary freely with allophone [gw]. Especially in final position w and y show some overlapping with corresponding i and u.[12] Palatal y may have a slight [dy] stop onset syllable initially.

3.3. The treatment of consonants in loanwords is presented from two aspects: the first, tracing the individual CSp phonemes and phoneme series, reveals most of the regular donor to recipient identifications and adaptations; the second, discussing the differences between the two models according to type, describes the residue not covered by the first. It also summarizes the extent of a number of changes that involve several different phonemes of the donor model.

3.3.1. Voiced stops and their voiced fricative allophones of the secondary system have been borrowed as voiced stops, except in pʰáka (vaca) *cow* which may be an older loan.

Initial b: bandéer (bandera) *flag*, bapór (vapor) *ship*, barahia- (barajar) *to shuffle cards*, bář (barra) *crow bar*, baředúř (MSp barredor) *broom*, batʰéh (batéa) *platter*, baranšíh (barana) *belt*, basúr (basura) *rubbish*, bauldíh (baúl) *trunk*, bendesia- (bendecir) *to bless*, bilkóš (bizcocho) *biscuit*, bóte (bote) *sailboat*, botʰéy ~ botʰeydíh (botella) *bottle*, botǫ́n ~ botǫ́ (botón) *button*, biék (viaje) *trip*, biek?ǫ́ɾ (viajero) *traveller*, bieřn?éd (viernes) *Friday*, bél (vela) *sail*, bentia- (ventear) *to winnow*, bulikpáh (borilico) *a tree*.

Medial b: kambia- (cambiar) *to change*, sǫǫbéeř (sombrero) *hat*, ?amgobeřnadóh (gobernador) *governor*, seřbii- (servir) *to be useful*, habón (jabón) *soap*, sebóy (cebolla) *onion*, kabáy (caballo) *horse*, kabúy (cabulla) *string*, sabad?éd (sábado) *Saturday*, ?aldibinaa- (adivinar) *to soothesay*, talbéh (tal vez) *perhaps*, hueb?éd (jueves) *Thursday*, nabák (navaja) *jackknife*.

Final b (after vowel apocope): kláb ~ kaláp (clavo) *nail*, bïkaláp (clavo) *athlete's foot*, kašíp ~ kašíb (cachimba) *pipe*, kapšíh (cabo) *rope*.

Initial d: degúlp (degolpe) *suddenly*, depár (deuda) *debt*, deparaa- (deuda) *to have debt*, domig?éd (domingo) *Sunday*.

Medial d: ?aldibinaa- (adivinar) *to soothesay*, ?amgobeřnadóh (gobernador) *governor*, ?aɾdit (ardita) *squirrel*, baředúr (barredor) *broom*, bendesia- (bendecir) *to bless*, kandáu (candado ~ candao) *lock*, madrin ?ųáɳ (madrina) *godmother*, maldesia- (maldecir) *to curse*, padrinhóy (padrino) *godfather*, řondaa- (rondar) *to spy*, sabad?éd (sábado) *Saturday*.

In two words the dr sequence has been borrowed without the d: pʰáɾe (padre) *priest*, pʰaadíh ~ pʰadíh *parsonage*, and talařsir- (taladro) *to drill*. In the words ?atabuldíh (ataúd) *coffin* and in *deb- in depár (deuda) debt, the ud sequence of the Csp model has been borrowed as b.

Initial g: gan- (ganar) *to earn*, gastaa- (gastar) *to spend*, gát (gato) *cat*, gainendíh (gallinero) *chicken pen*, góma (goma) *glue*, ?amgobernadóh (gobernador) *governor*.

Medial g (except before ua [wa]): pag- (pagar) *to pay*, degúlp (de golpe) *suddenly*, ?angóst (langosta) *locust*, púrg (purgante) *purge*, negúřo (negro) *negro*, tigříə (tigrillo) *ocelet*, domig?éd (domingo) *Sunday*, maglebíh (mangle) *a tree*.

The sequence gu [gw] before a is borrowed as w, which in the primary system has a syllable onset allophone of [gw]: ?awąt- (aguantar) *to suffer*, awakát (aguacate) *avocado*.

3.3.2. CSp voiceless stops seem to distinguish early and later loans. In early

[12] See footnote[4].

loans voiceless stops preceding a stressed vowel were borrowed as voiceless fortis aspirated stops: pˀ: pʰáɾe (padre) *priest*, pʰatkʰóna (plata) *silver, money*; tˀ: tʰoodíh (toldo) *sleeping net*; -tˀ: ʔentʰíɾ (entero) *completely*, botʰeydíh (botella) *bottle*, batʰéh (batea) *platter*; and kˀ: kʰúsi (cochino ~ cucho) *pig*. There are three other examples in which morpheme identification, rather than stress, appears to have caused the word to be loaned with fortis kʰ: ʔišibokʰa- (equivocar) *to make a mistake*, lukʰo- ~ lukʰa- (loco) *to be crazy*, šikʰedíh (chiquero) *pig sty*.

In all other words CSp p, t, k, are borrowed as voiceless lenis stops: pandáu (pan *bread*) *bread fruit*, padrinhóy (padrino) *godfather*, páat (parte) *share*, palisád (palisada) *blocked river*, prestaa- (prestar) *to borrow*, ponee- (poner) *to put*, pag- (pagar) *to pay*, pulúm (plomo) *lead*, polbóh (polvo) *dust*, pịąhǫ́h (piña) *pineapple*, pwertdíh (puerta) *door*, pilón (pilón) *mortar*, pilonhúa *pestle*, palitón (paletón) *toucan*, patík (patica) *duck*, dopatík *wild duck*.

Medial p: ʔapostaa- (apostar) *to bet*, degúlp (de golpe) *suddenly*, dispeřtór (inspector) *police officer*, ʔempéy (empella) *pork rind*, ʔespʰék (espejo) *mirror*, kąpę́ra (compañero) *friend*, kąpę́na *friends*, kulpara- (cùlpa *blame*) *to have blame*, kulpšuku- *to be blameless*, lapipe- (lápiz *pencil*) *to paint with pencil*, sapotbíh (sapote) *a fruit*, sepía (cepillo) *plane*, tąɾ́ąp (trampa) *trap*, tąɾpíš (trapiche) *sugar cane press*, toř pér (torpedo) *dynamite*, bapór (vapor) *ship*, kampán (campana) *bell*, sapún (espuma) *foam*.

Initial t: bïtalón ~ bïtalǫ́ (talón) *heel*, patabál (tabla) *board*, tiendíh (tienda) *store*, tigřía (tigrillo) *ocelet*, tąɾpíš (trapiche) *sugar cane press*, torpér (torpedo) *dynamite*, talbéh (tal vez) *perhaps*. There is one example of initial t borrowed as p: pikét (tiquete) *ticket*.

Medial t (often final after vowel apocope): botǫ́n ~ botǫ́ (botón) *button*, patík (patica) *duck*, ʔawakát (aguacate) *avocado*, bóte (bote) *boat*, gát (gato) *cat*, ʔieřkót (orquilla) *forked stick*, lorít (lorita) *parrot*, pʰatkʰóna (plata) *money*, pwertdíh (puerta) *door*, sapotbíh (sapote) *a fruit*, sínta (sinta) *roofing strips*, martiʔéd (martes) *Tuesday*, sentii- ~ sentia- (sentir) *to become aware of*, prestaa- (prestar) *to borrow*, gastaa- (gastar) *to spend*, molestaa- (molestar) *to molest*, dispetóř ~ dispeřtóř (inspector) *police officer*, sootík ~ sořtík (sortija) *ring*, ʔestúpʰa ~ ʔestúp (estufa) *stove*, ʔintéřn (linterna) *lantern*, ʔatabuldíh (ataúd) *coffin*, ʔangóst (langosta) *locust*, ʔapostaa- (apostar) *to bet*, ʔardít (ardita) *squirrel*, bentia- (ventear) *to winnow*, ʔentíř (entero) *completely*, koretdám (?) *knuckles*, páat (parte) *a share*, pʰiésta (fiesta) *feast*.

Initial k: kappáh ~ kapáh (cabo) *handle*, kapšíh (cabo) *cable, rope*, kaihǫ́h (calle) *street*, kařseldíh (carcel) *jail*, pakúɾs (cruz) *cross*, bïkláp (clavo) *athlete's foot*, ʔawakát (aguacate) *avocado*, seřkáu (cercado) *wall*, bilkóš (bizcocho) *biscuit*, kapʰéh (café) *coffee*, kabáy (caballo) *horse*, kabúy (cabulla) *string*. kašíb ~ kašíp (cachimba) *pipe*, kamís (camisa) *shirt*, kanél (canela) *cinnamon*, kandáu (candado ~ candao) *lock* komisário (comisario) *deputy*, kąpę́ra (compañero) *friend*, kąpę́na, *friends*, kés (queso) *cheese*, kaláp (clavo) *nail*, koretdám (?) *knuckles*, kampán (campana) *bell*, kahondíh (cajón) *box*, kambía- (cambiar) *to change money*, kořahék (coraje) *courage*, kulpara- (culpa) *to be at fault*, kulpšuku- *to be innocent*, kusářa (cuchara) *spoon*.

Medial k (often final after vowel apocope): pʰáka (vaca) *cow*, mierkoleʔéd (miércoles) *Wednesday*, patík (patica) *duck*, dopatík *water duck*, bulilikpáh (borilico) *a tree*, šalék (chaleco) *vest*, ʔieřkót (orqueta) *forked stick*, pikét (tiquete) *ticket*, seřkáu (cercado) *fence*.

There are several more words which exhibit a final k, but in all cases it results from kʰ or g according to the Waunana morphophonemic pattern of alternation. See **3.4.2.**

3.3.3. CSp fricatives do not all have close counterparts in the primary phonemic

system, therefore they have to be treated individually.

CSp f has been consistently borrowed as Waunana pʰ. Initial f: pʰia- (fiar) *to give credit*, pʰařól (farrol) *lantern*, pʰiésta (fiesta) *feast*. Medial f: ʔestúp ~ ʔestúpʰa (estufa) *stove*, kapʰéh (café) *coffee*.

Initial x ~ h has been borrowed as h: habón (jabón) *soap*, hiéř (hierro) *iron*, hář (jarra) *pitcher*, hwés (jues) *judge*, hwebʔéd (jueves) *Thursday*.

Medial x ~ h has been borrowed as kʰ (k after vowel apocope), except in words in which morpheme identification has intervened: biékʰa ~ biék (viaje) *trip*, biekʔǫ́r *travellers*, soř tíkʰa ~ soř tík (sortija) *ring*, nabákʰa ~ nabák (navaja) *jackknife*, ʔákʰo ~ ʔahǫ́h (ajo) *garlic*. Words involving morpheme identification are: ʔespheg ~ ʔesphék (espejo) *mirror*, kořahég (coraje) *courage*, nąrąnhǫ́h (naranja) *orange*, ʔahǫ́h ~ ʔákʰo (ajo) *garlic*, barᵊhia- (barajar) *to shuffle cards*.

CSp s has almost consistently been borrowed as s: Initial s: sebóy (cebolla) *onion*, sabadʔéd (sábado) *Saturday*, soř tík (sortija) *ring*, sapotbíh (sapote) *a fruit tree*, sařsía (sarcillo) *earring*, sentii- (sentir) *to become aware of*, sepía (cepillo) *plane*, serbii- (servir) *to serve*, sía (silla) *chair*, sínta (sinta) *roofing strips*, sǫbéeř (sombrero) *hat*, saltdám (salto) *waterfall*, serkáu (cercado) *wall*.

Medial s (often final after vowel apocope): kamís (camisa) *shirt*, komisário (comisario) *deputy*, meʔís (mellizo) *twin*, maldesia- (maldecir) *to curse*, bendesia- (bendecir) *to bless*, hós (oso) *bear*, késo (queso) *cheese*, pʰinsoldáu (frisol) *beans*.

sC sequence: pʰiesta (fiesta) *celebration*, gastaa- (gastar) *to spend*, ʔapostaa- (apostar) *to bet*, ʔangóst (langosta) *locust*, ʔestúpʰa (estufa) *stove*, prestaa- (prestar) *to borrow*, dispetór (inspector) *police officer*, ʔesphég (espejo) *mirror*, sapún (espuma) *foam*. In the latter example the medial s of the donor language has been metathesized into initial position in the recipient.

Cs sequence: karseldíh (cárcel) *jail*, sařsía (sarcillo) *earrings*, pakúrs (cruz) *cross*.

Final s has been borrowed in some words, but not in others: hwés (juez) *judge*, ʔařós ~ ʔařó (arroz) *rice*, talbéh (talvez) *perhaps*, lunʔéd (lunes) *Monday*, martiʔéd (martes) *Tuesday*, mierkoleʔéd (miércoles) *Wednesday*, hwebʔéd (jueves) *Thursday*, bieřnʔéd (viernes) *Friday*.

3.3.4. Like stops the CSp affricate č appears to have received different treatment in older loans. In several words, which are no longer recognized as loans by the Waunana, č has been borrowed as s: kʰúsi (MSp cucho ~ cochino) *hog*, mís (micho) *cat*, kusářa (cuchara) *spoon*. In modern loanwords it consistently follows the Waunana phoneme š[13] which has an affricate [č] allophone at the syllable onset. Initial č: šalék (chaleco) *vest*, šinšór (chinchorro) *fishing net*, šǰš (chinche) *bed bug*, šikʰedíh (chiquero) *pig pen*. Medial č (often final after vowel apocope): šinšór (chinchorro) *fishing net*, šǰš (chinche) *bed bug*, trǰš (trincha) *ditch*, bilkóš (bizcocho) *biscuit*, kašíp (cachimba) *pipe*, káši (cacho) *horn*, řąšdíh (rancho) *hut*, tąrpíš (trapiche) *cane press*.

CSp ǰ and y have not been borrowed when following high front i: sía (silla) *chair*, tigría (tigrillo) *ocelet*, sařsía (sařcillo) *earrings*, lumía (lomillo) *loins*. Under all other conditions they have been borrowed as y: yá (ya) *already*, yabméh (llave) *key*, ʔayudaa- (ayudar) *to help*, kabáy (caballo) *horse*, kabúy (cabulla) *string*, kayhąh (calle) *street*, sebóy (cebolla) *onion*, ʔempéy (empella) *hide*, botʰeydíh (botella) *bottle*. In the word meʔís (mellizo) *twins*, ǰ has been borrowed as a ʔ.

3.3.5. CSp nasals m, n, ñ have been borrowed in two ways. In what appears to be an older series of loanwords, nasal continuants have been treated as markers

[13] Modern CSp loanwords also follow the allophone distribution pattern of syllable initial [č] and syllable final [š]: [čalék] (chaleco) *vest* [čǰš] (chinche) *bedbug*, [lipčaš-] (libra) *to weigh*.

of nasal vowel quality (see **2.3**). In all other loanwords they have been borrowed as m, n, and ny respectively.

Initial m has always been retained: madrín (madrina) *godmother*, mąglebíh (mangle) *mangrove tree*, makín (máquina) *machine*, maldesia- (maldecir) *to curse*, marti?éd (martes) *Tuesday*, me?ís ~ me?isnán (mellizo) *twins*, mierkole?éd (miércoles) *Wednesday*, mïnyék (muñeca) *doll*, mís (michi) *cat*, molestaa- (molestar) *to annoy*, multaa- (multar) *to fine*.

Intervocalic m: ?ařamaria- (almarearse) *to become nauseated*, domjg?éd (domingo) *Sunday*, góma (goma) *glue*, kamís (camisa) *shirt*, komisą́rio (comisario) *deputy*, lomía (lomillo) *loins*, pulúm (plomo) *shot*, tomín (tomino) *ten cents*. In sapún (espuma) *foam* it has been borrowed as n.

m before homo-organic stop: ?empéy (empella) *hide*, ?ent^{h}ír (entero) *whole*, kambia- (cambiar) *to change*, kampán (campana) *bell*.

Initial n: nabák^{h}a (navaja) *jack knife*, negúřo (negro) *negro*, nąrąnhǫ́h (naranja) *orange*.

Medial n: ?arín (harina) *flour*, baranšíh (barana) *belt*, gan- (ganar) *to win*, gainendíh (gallinero) *chicken barn*, ?intérn (linterna) *lantern*, kanél (canela) *cinnamon*, lun?éd (lunes) *Monday*, madrin?ų́ą́n (madrina) *godmother*, padrinhóy (padrino) *godfather*, ponee- (poner) *to put*, tomín (tomino) *ten cents*.

Final n: habón (jabón) *soap*, kahondíh (cajón) *box*, palitón (paletón) *toucan*, pandáu (pan) *bread fruit*, pilón, pilonhúa (pilón) *mortar*, *pestle*.

n before homo-organic consonant: bandéer (bandera) *flag*, bendesia-(bendecir) *to bless*, bentia- (ventear) *to winnow*, šinšǫ́ř (chinchorro) *fishing net*, ?intérn (linterna) *lantern*, kandáu (candado) *lock*, rondaa-(rondar) *to spy*, sentii- (sentir) *to become aware of*, sínta (sinta) *roofing strips*, tiendíh (tienda) *store*. In the word dispeřtór (inspector) *police inspector*, n is metathesized into initial position and borrowed as d.

Cn sequence: gobeřnadóh (gobernador) *governor*, biern?éd (viernes) *Friday*.

In the word mïnyék (muñeca) *doll*, ñ is borrowed as ny.

3.3.6. Since Waunana did not originally possess a lateral, CSp l underwent a variety of treatments until sufficient bilingualism caused it to be borrowed as a phoneme.

In older loans initial l was borrowed as glottal stop: ?intérn (linterna) *lantern*, ?angóst (langosta) *locust*. Medially it was replaced by length or ř: t^{h}oodíh (tolde) *sleeping net*, p^{h}aatk^{h}ón ~ p^{h}atk^{h}óna (plata) *silver*, ?ařamaria- (almarearse) *to become nauseated*.

In more recent loans it has been preserved with phonemic status: lapipe- (lápiz) *pencil*, luk^{h}o- ~ lok^{h}oo- ~ luk^{h}á- (loco) *to be crazy*, lumía ~ lomía (lomo ~ lomillo) *loins*, lořít (lorita) *parrot*, molestaa- (molestar) *to molest*, mierkole?éd (miércoles) *Wednesday*, šalék (chaleco) *vest*, palitón (paletón) *toucan*, ?alį́ą (aliño) *spice*, bïtalón ~ bïtalǫ́h (talón) *heel*, palisád (palisada) *block in river*, pilón (pilón) *mortar*, pilonhúa *pestle*, kláp ~ kaláp (clavo) *nail*, bïkaláp (clavo) *athlete's foot*, degúlp (de golpe) *suddenly*, maldesia- (maldecir) *to curse*, talbéh (tal vez) *perhaps*. When occurring in a Cl cluster the lateral has undergone metathesis as in: pulum ~ pulumdau (plomo) *shot*, patabál (tabla) *board*, kláp ~ kaláp (clavo) *nail*.

In several words an epenthetic l has developed before the d: ?aldibina:- (adivinar) *to soothsay*, ?atabuldíh (ataúd) *coffin*.

3.3.7. The phonemic distinction in CSp between a single flap r and a multiple flap ř posed serious phonic interference with Waunana vibrants which in pre-Spanish times appear to have consisted of retroflexed ŗ and ř trilled. However, before stops the trill appears to have been slight, thus creating a basis for overlap with the phonemes of the secondary system. The result has been confusion in which both native and loan words appear with freely varying alternants, especially in intervocalic posi-

tion. Initially, where Waunana did not have any vibrants, the CSp trill appears universally. In intervocalic position both CSp phonemes may appear as [r], [ɾ] or [r̃]. In word final position, the situation is much like the intervocalic position, but the trill tends to predominate. Initial r̃: r̃ąšdíh (rancho) hut, r̃ondaa- (rondar) to spy.

Medial r̃, and r (often final after vowel apocope): ʔarín ~ aɾín ~ ʔarín (harina) *flour*, ʔarosdáu (arroz) *rice*, ʔarамaría- ~ ʔaɾmaɾia- (MSp almarearse) *to become nauseated*, baɾahia (barajar) *to shuffle*, bar̃edúr̃ (MSp barredor) *broom*, hïrién ~ hor̃iéna (arriera) *army ant*, komisário (comisario) *deputy*, kʰor̃ahék (coraje) *courage*, kusár̃a (cuchara) *spoon*, lor̃ít (lorita) *parrot*, nąɾąnhǫ́h (naranja) *orange*, pʰar̃ól (farrol) *lamp*, ʔentʰír̃ (entero) *whole*, tor̃pér̃ (torpedo) *dynamite*, šinšór̃ (chinchorro) *fishing net*, sǫbéer̃ (sombrero) *hat*.

In older loans CR underwent metathesis as in: negúr̃o (negro) *negro*, pakúɾs (cruz) *cross*, tąɾąp (trampa) *trap*, tąɾpíš (trapiche) *sugar cane press*, pʰinsoldáu (frisol) *bean*. In more recent loans it has been retained: tr̃j̃š (trincha) *ditch*, prestaa- (prestar) *to borrow*, padrinhóy (padrino) *godfather*, tigría (tigrillo) *ocelet*.

In several older loans both RC and CR sequences have been borrowed as VC; sootík (sortija) *ring*, sǫbéer (sombrero) *hat*. In recent loans RC has been borrowed without change: tor̃pér̃ (torpedo) *dynamite*, ʔamgobeɾ̃nadóh (gobernador) *governor*, ʔar̃dít (ardita) *squirrel*, ʔier̃kót (orqueta) *forked stick*, kar̃seldíh (cárcel) *jail*, martiʔéd (martes) *Tuesday*, mierkoleʔéd (miércoles) *Wednesday*, púrg (purgante) *purge*, pwertdíh (puerta) *door*, sar̃sía (sarcillo) *earrings*, ser̃bii- (servir) *to be useful*, ser̃káu (cercao) *fence, wall*.

Final r is borrowed as h in ʔamgobeɾ̃nadóh (gobernador) *governor*. More frequently, however, it is borrowed as r̃: dispeɾ̃tór̃ (inspector) *police inspector*, bar̃edúr̃ (MSp barredor) *broom*, bapór̃ ~ bapóɾ (vapor) *ship*.

3.4. If consonant adaptations in loanwords are now viewed in terms of type or process, the following differences between models can be added or summarized:

3.4.1. Consonants in loanwords may differ from the CSp model in arrangement, i.e., there are differences in the permitted or at least preferred consonant sequences. We observe metathesis in: pakúrs (cruz) *cross*, sapún (espuma) *foam*, dispeɾ̃tór̃ (inspector) *police inspector*, pʰinsoldáu (frisol) *beans*, tąɾpíš (trapiche) *sugar cane press*. Metathesis may also be accompanied by vowel splitting as in: tąɾąp (trampa) *trap*, kaláp (clavo) nail, bïkaláp (clavo) *athlete's foot*, patabál (tabla) *board*, ʔatabuldíh (ʔataúd) *coffin*, ʔar̃amaria- (almarearse) *to become nauseated*.

3.4.2. Consonants in loanwords also exhibit differences in consonant quality. The regular or patterned identifications and substitutions have been discussed under **3.3.** There are, however, also a number of apparently arbitrary substitutions of consonants as in: ʔintérn (linterna) *lantern*, ʔangóst (langosta) *locust*, meʔís (mellizo) *twin*, bilkóš (bizcocho) *biscuit*, bulilikpáh (borilico) *a tree*, dispeɾ̃tór̃ (inspector) *police inspector*, gainendíh (gallinero) *chicken barn*, pʰinsoldáu (frisol) *beans*, pikét (tiquete) *ticket*.

In addition, it is necessary to point out a series of secondary differences due to the morphophonemic alternations of Waunana described in **3.2.** According to this pattern all voiced or voiceless aspirated stops that occur in word final position, either in the CSp model or after vowel apocope in the Waunana model, are rendered as voiceless and unaspirated respectively: biék < biékʰa (viaje) *trip*, kaláp < kaláb (clavo) *nail*, ʔesphék < ʔesphég (espejo) *mirror*, kʰor̃ahék < kʰor̃ahég (coraje) *courage*, kašíp < kašíb (cachimba) *pipe*, nabák < nabákʰa (navaja) *jackknife*.

The same morphophonemic rule applies when voiced or voiceless aspirated stops occur as first members in clusters with

voiceless stops: biek?ǫ̣r < biékʰa (viaje) *trip*, kappáh ~ kapáh < *kab (cabo) *handle*, lipšaš- < *lib (libra) *pound*, nabakdám < nabákʰa (navaja) *jackknife*.

3.4.3. To the minus differences in consonant quantity discussed in **3.3.** there must be added the reduction of clusters of identical consonants resulting in the process of compounding with Waunana morphemes as in: tiendíh *store*, < *tiend (tienda) plus díh, kulparaa- *to be guilty*, < *kulp (culpa) plus paraa-, kapáh *handle* < *kab (cabo) plus páh, pʰadíh *parsonage* < *pʰaḍ ~ pʰaṛ (padre) plus dih, tʰoodíh *sleeping net* < *tʰood (tolde) plus dih depar *debt* < *deb (deber) plus par, and tominumíh *twenty cents* < tomin plus numíh. In two words the reduction extends to whole syllables: deparaa- < depár plus paraa- *to have debt*; bulikpáh < bulilikpáh *a tree*.

The word púrg (purgante) *purge* has been borrowed minus the two final syllables most likely in analogy to Waunana nouns like pʰárg *thickness*, ?íurg *newness* and etc.

3.4.4. Added consonant quantity, generally ? or h, always occurs when the CSp model begins with a vowel. In the Waunana model all words begin with a consonant: ?ákʰo (ajo) *garlic*, ?aldibinaa- (adivinar) *to soothesay*, ?alį̨ą (aliño) *spice*, ?apostaa- (apostar) *to bet*, ?ařdít (ardita) *squirrel*, ?ařín (harina) *flour*, ?ařamařia- (almarearse) *to become nauseated*, ?ařó (arroz) *rice*, ?atabuldíh (ataúd) *coffin*, ?ayudaa- (ayudar) *to help*, ?awakát (aguacate) *avocado*, ?awą̨t- (aguantar) *to suffer*, ?empéeh (empella) *hide*, ?entʰír (entero) *whole*, ?esphég (espejo) *mirror*, ?estúpʰa (estufa) *stone*, ?išibokʰa- (equivocar) *to make speech error*, ?ieřkót (orqueta) *forked stick*, ?ohia- (ojear) *to cast evil eye*, ?u (o) *or*, ?íglés (inglés) *Englishman*, hĭřién (arriera) *army ants*, hogaa- (ahogar) *to drown*, horapa- (hora) *to be time*, hós (oso) *bear*, dispeřtóř (inspector) *police inspector*.

There are, however, also a few apparently arbitrarily developed consonants as in: ?atabuldíh (ataúd) *coffin* (this could be in analogy with tabál), ?aldibinaa- (adivinar) *to soothsay*, bilkóš (bizcocho) *biscuit*.

4.1. Loanwords have been regularly accepted as simple roots or stems. The exceptions involve a few words in which morpheme identification has occurred. Stems thus 'analyzed' as complex are: ?ařamařia- (almarearse) *to become nauseated* from ?ařa *raft* plus ma- *to go* plus -ria *a pseudo auxiliary verb*; šikʰedíh (chiquero) *chicken pen* from ši- *demonstrative clitic* plus kʰe- *to feed animals* plus díh *house*; basúr (basura) *garbage* from ba plus sur *garbage* [compare Waunana native nemsúr *garbage*]; kořahék (coraje) *courage* from kʰořá *umbilicus*, plus -hég *hard or quick*; bendesia- (bendecir) *to bless*, from ben *familiar spirit* plus de- *to give* plus -sia *auxiliary verb*. ?išibokʰa- (equivocarse) *to make a speech error* from ?i *mouth* plus ši *demonstrative particle* plus bo- *to stutter* [compare native bobork- *to stutter*] plus -kʰa *reduplicated action*.

In a number of nominal stems final -ra ~ řo of CSp model has been identified with Waunana -ra ~ řa *person or being indicator*. Such stems are pluralized according to the regular Waunana model with -na *replacive pluralizer*.[14] The following occur: hĭřiéna—the singular does not occur since the noun is treated as collective—(arriera) *soldier ants*, kąpę́na from kąpę́ra (compañero) *friend*, negúna from negúřo (negro) *negro*, ?įglesnán from ?įglés (inglés) *Englishman*, me?isnán from me?ís (mellizo) *twins*. Possibly also belonging here is the word gainendíh from *gainen ~ gainan (gallinero)[15] *chicken house*.

Other nominal stems which occur as compounded or derived with Waunana stems or derivative affixes are as follows (with affixes cited after hyphen in contrast to stems, cited without preceding hyphen):

[14] As examples of native replacive plurals see: ?ĭyra *woman*, ?ĭyna *women*, ?a̤tʰa̤a̤ra *chicken*, ?a̤tʰa̤a̤na *chickens*.

[15] For similar pluralization see: saakʰien~saaknan *dogs:* also compare hĭriena *army ants*.

bĭh: *tree trunk, foot, etc*: bĭkláp *athlete's foot*, bĭtalón *heel*, mąglebĭh *mangrove tree*.

-dam *diminutive*: kořetdám *knuckle*, saltdám *waterfall*.

-dau *seed, unit, etc.*; ařosdáu *rice*, kandáu *lock*, pandáu *breadfruit*, pʰinsoldáu *bean*, pulumdáu *shot for gun*.

díh *house, container*: ʔatabuldíh *coffin*, bauldíh *trunk*, botʰeydíh *bottle*, šikʰedíh *peg pen*, gainendíh *chicken pen*, kahondíh *box*, kařseldíh *jail*, pʰaadíh *parsonage*, pwertdíh *door*, řašdíh *hut*, tiendíh *store*, tʰoodíh *sleeping net*.

do *water, river*; dopatik *wild duck*.

ʔéd *moon*: domįgʔéd *Sunday*, lunʔéd *Monday*, martiʔéd *Tuesday*, mierkoleʔéd *Wednesday*, huebʔéd *Thursday*, bieřnʔéd *Friday*, sabadʔéd *Saturday*.

-hąh *expanse*; (See Waunana ʔedhąh *sky*, dohąh *surface of river*) kaihąh *street*.

-heg *strength*: ʔesphég *mirror*, kořahék *courage*.

hóy *old man*; padřinhóy *godfather*.

húa *hand*: pilonhúa *pestle*.

-hǫh *fruit*: ʔahǫh *garlic*, naranhǫh *orange*, pįąhǫh *pineapple*, wanpanhǫh *guanábana*.

méh *penis* (See Waunana tʰeṛméh *trigger of gun*): yabméh *key*.

numíh *two*: tominumíh *twenty cents*.

ʔǫṛ *people*: biekʔǫṛ *travellers*.

páh *tree, lumber*: patabál *board*, bulikpáh *a tree*, kapáh *handle*.

-pera *people*: kąpéra *friend*.

-šĭh *rope*: baranšĭh *belt*, kapšĭh *rope*.

ʔųán *old female*: madřinʔųán *godmother*.

-ř nominal ~ nominalizer: bandéeř *flag*, bař *crowbar*, hář *jar*, hiéř *iron*, sǫǫbéeř *hat*.

In analogy with -tař nominalizer: dispeřtóř *inspector*, baředúř *broom*.

A number of originally nominal forms occur in compounds with Waunana verb stems: horapa- *to be time*, kulpšuku- *to be innocent*, kulparaa- *to be guilty*, lapipe- *to paint with lipstick*, lipšaš- *to weigh*, talařsir- *to drill a hole*.

Verbal stems treated as derived with -kʰa *reduplicated action indicator* are: lukʰo ~ lukʰa- *to be crazy*, ʔišibokʰa- *to make a speech error*.

The majority of the CSp verb stems have undergone additional verbal derivation in the Waunana model by lengthening the final vowel of the stem as in: ʔaldibinaa- (adivinar) *to divine*, ʔapostaa- (apostar) *to bet*, ʔayudaa- (ayudar) *to help*, gastaa- (gastar) *to spend*, hogaa- (ahogar) *to drown*, molesta- (molestar) *to molest*, ponee- (poner) *to put*, prestaa- (prestar), *to borrow*, řondaa- (rondar) *to spy*, sentii- (sentir) *to become aware of*, multaa- (multar) *to fine*, serbii- (servir) *to be useful*, lukʰoo ~ lukʰa- *to be crazy*.

5.1. Phonologically CSp loanwords have added a new phoneme, voiced lateral l. In the earliest loans it was borrowed as vowel length. In what appears to be a second stage it was borrowed, but was limited to the distribution of Waunana vibrants. Today it occurs in all word positions. It is interesting to note that ařipada (containing an ř with a slight lateral release) *demon*, from neighbouring Ẹpẹra dialects has been borrowed as ʔalpádi. Equally striking are the epenthetic laterals in ʔatabuldíh (ataúd) *coffin* and ʔaldibinaa- (adivinar) *to soothsay*.

Loanwords have also introduced a new distribution for ř and g. In native words they are restricted to word medial and word final positions. They now occur also initially: řondaa- (rondar) *to spy*, řašdíh (rancho) *hut*, gan- (ganar) *to earn, win*, gastaa- (gastar) *to spend*.

For vibrants, loanwords have introduced a new allophone [ř]. This new allophone has created confusion, so that some words now exhibit alternants in all three allophones ʔařín ~ ʔařín ~ ʔařín (harina) *flour, etc.*

5.2. Morphologically the influence of CSp loanwords on Waunana appears to have been minor. Only stem morphemes and no affixial morphemes have been borrowed. In a few words Spanish culture has exerted pressure toward semantic displacements, like hąpa *canoe* in ʔedhąʔemháp *airoplane* (literally: *the canoe in the*

sky). Likewise the auxiliary verb horu- *travel on a vehicle* (of which they had only water vehicles like canoes and rafts), now includes air travel.

5.3. In the area of syntax, however, CSp influence has produced innovations. The most prominent of these is the coordinating conjunction. Waunana exhibits few coordinate constructions at sentence level. If any occur they are linked only by the intonational contour. Under CSp influence two coordinate conjunctions have developed, ʔu from CSp (o) *or*; and pari in a meaning extension from *in vain* to also mean *but*, from Spanish (pero) *but*: pï mahú ʔu pï mabá? *Are you or are you not going?* mį̈ mahú pari pï mabám. *I am going but you are not going.*

6.1. The dictionary of loanwords follows. For Waunana the phonemic form is given. The CSp form is given both in standard orthography and in its CSp phonetic pronunciation.

1. ʔáhǫ́h ~ ʔakʰóh < ajo [áho] *garlic*
2. ʔaldibinaa- < adivinar [aðiβinár] *to soothsay*
3. ʔalį̨ą < aliño [alíño] *spice*
4. ʔamgobeřnadóh < ʔam *third person plural possessive pronoun* plus gobernador [goβeřnaðór] *governor*
5. ʔangóst < langosta [lɔŋgósta] *locust*
6. ʔapostaa- < apostar [apɔstár] *to bet*
7. ʔařdít < ardita [ařðíta] *squirrel*
8. ʔařín ~ ʔařín < harina [ařína] *flour*
9. ʔařamařia- ~ ʔaɾmaɾia- < MSp almarearse [almařeářse] *to nauseate*
10. ʔařosdáu < arróz [ařɔ́s ~ ařó] *rice* plus dau *seed, etc.*
11. ʔatabuldíh < ataúd [ataúð] *coffin* plus dih *house*
12. ʔayudaa- < ayudar [ayuðár] *to help*
13. ʔawakát < aguacate [aɣwakáte] *avocado*
14. ʔawą̨t- < aguantar [aɣwɔntár] *to be able to bear*
15. bandéeř < bandera [bɔndéřa] *flag*
16. bapór < vapór [bapɔ́r] *ship*
17. baɾahia- < barajar [bařahár] *to shuffle cards*
18. baranšíh < barana [bařána] *belt*
19. bář < barra [bářa] *crow bar*
20. baředúř < MSp barredor [bařeðór] *broom*
21. basúr < basura [basúřa] *rubbish*
22. batʰéh < batéa [batéa] *wooden dish*
23. bauldíh < baúl [baúl] *trunk* plus dih *house*
24. bél < vela [béla] *sail*
25. bendesia- < [bɛndesír] *to bless*
26. bentia- < ventear [bɛnteár] *to winnow*
27. biék < viaje [biáhe] ~ [biáxe] *trip*
28. biekʔóɾ < viaje plus ʔóɾ *people*
29. bieřnʔéd < viernes [biɛ́řnes] ~ [biɛ́řne] *Friday* plus ʔéd *moon*
30. bilkóš < bizcocho [biskóčo] *biscuit*
31. bïkláp < bïh *foot* plus clavo [kláβo] *yaws, ulcer*
32. bïtalón ~ bïtalǫ́h < *foot* plus talón [talón] *heel*
33. bǫ́te < bote [bóte] *boat*
34. botón ~ botǫ́ < botón [botón] *button*
35. botʰéy ~ boteydíh < botella [botéja] *bottle*
36. bulikpáh ~ bulilikpáh < borelico [borelíko] *a tree* plus pa *tree*
37. šalék < chaleco [čaléko] *vest*
38. šikʰedíh < chiquero [čikéřo] *pig pen* plus díh *house*
39. šinšóř < chinchorro [čɪnčóřo] *fishing net*
40. šį̈jš < chinche [čínče] *bed bug*
41. degúlp < de golpe [de gólpe] *all at once*
42. depár < deuda [déuða] *debt*
43. deparaa- < *debt* plus para- *to have debt*
44. dispetóř ~ dispeřtóř < inspector [ɪnspɛktór] *inspector, police*
45. domįgʔéd < domingo [domíŋgo] *Sunday* plus ʔed *moon*
46. dopatík < do *water* plus pato, patica [patíka] *duck*
47. ʔempéeh ~ ʔempéy < empella [ɛmpéja] *skin*
48. ʔentʰíɾ < entero [ɛntéřo] *whole*
49. ʔesphég ~ ʔesphék < espejo [ɛspého] ~ [ɛspéxo] *mirror*

50. ʔestúpʰa ~ ʔestúp < estufa [ɛstúfa] *stove*
51. gan- < ganar [ganáɾ] *to win*
52. gastaa- < gastar [gɔstáɾ] *to spend*
53. gát < gato [gáto] *cat*
54. gainendíh < gallinero [gaʝinéɾo] *chicken house* plus díh *house*
55. góma < goma [góma] *glue*
56. habón < jabón [haβón] *soap*
57. hař < jarra [hářa] *jar, dish*
58. hiéř < hierro [yéřo] *iron*
59. hïřién ~ hořiéna < arriéřa [ařiɛřa] *ant*
60. hogaa- < ahogar [aoɣáɾ] *to drown*
61. horapa- < hora [óřa] *hour* plus pa- *to be*
62. hós < oso [óso] *bear*
63. hweb?éd < jueves [hwéβes] ~ [hwéβe] *Thursday* plus ʔéd *moon*
64. hwés < juez [hwɛ́s] *judge*
65. ʔišibokʰa- < equivocar [ekiβokáɾ] *to make a mistake*
66. ʔieřkót < orqueta [ɔrkéta] *forked branch*
67. ʔiglesnán < ingleses [ɪŋglésɛs] *Englishmen*
68. ʔintéřn < linterna [lɪntéřna] *lantern*
69. kabáy < caballo [kaβáʝo] *horse*
70. kabúy < cabulla [kaβúʝa] *string*
71. káši ~ káš < kacho [káčo] *ear, horn*
72. kašíb ~ kašíp < cachimba [kačímba] *pipe*
73. kaihɸ́h < calle [káje] *street* plus-hɸh *an expanse*
74. kahondíh < cajón [kahón] *box* plus díh *house*
75. kambia- < cambiar [kɔmbiáɾ] *to change*
76. kamís < camisa [kamísa] *shirt*
77. kampán < campana [kɔmpána] *bell*
78. kanél < canela [kanéla] *cinnamon*
79. kandáu < candado [kɔndáo] *padlock*
80. kɸpéra < compañero [kómpañéɾo] *friend, companion*
81. kɸpéna *friends, companions*
82. kařseldíh < cárcel [kářsɛl] *jail* plus díh *house*
83. kapšíh < cabo [káβo] *cable, rope* plus šíh *bark rope*
84. kapʰéh < café [kafé] *coffee*
85. kappáh ~ kapáh < cabo [káβo] *handle* plus páh *pole, stick*
86. kés < queso [késo] *cheese*
87. kláp ~ kaláp < clavo [kláβo] *nail*
88. komisářio < comisario [komisářio] *police*
89. kořahég ~ k < coraje [kořáhe] *courage*
90. kořetdám < ? *knuckles*
91. kulparaa- < culpa [kúlpa] *to be guilty*
92. kulpšuku- < culpa [kúlpa] *to not be guilty*
93. kʰúsi < cochino [kočíno] *pig*
94. kusářa < cuchara [kučářa] *spoon*
95. lapipe- < lápiz [lápis] ~ [lápi] *pencil* plus pe- *to paint*
96. lipšaš- < libra [líβřa] *pound* plus šaš *to weigh*
97. lukʰoo ~ lokʰoo ~ lukʰa- < loco [lóko] *crazy, silly*
98. lumía ~ lomía < lomo ~ lomillo [lómo ~ lomíʝo] *sirloin*
99. lun?éd < lunes [lúnes] ~ [lúne] *Monday* plus ʔéd *moon*
100. lořít < lorita [loříta] *parrot*
101. madřin?ɥɸ́n < madrina [mɔðřína] *godmother* plus ʔɥɸ́n *grandmother*
102. mɸglebíh < mangle [móngle] *mangle* plus bïh *tree*
103. makín < máquina [mákina] *machine*
104. maldesia- < maldecir [malðesíɾ] *to curse*
105. marti?éd < martes [mártes] ~ [márte] *Tuesday* plus ʔéd *moon*
106. me?ís < mellizo [meʝíso] *twin*
107. mierkole?éd < miércoles [miɛřkole] *Wednesday* plus ʔéd *moon*
108. mïnyék < muñeca [muñéka] *doll*
109. mis < micho [míčo] *cat*
110. molestaa- < molestar [molɛstáɾ] *to molest*
111. multaa- < multar [multáɾ] *to fine*
112. nabák < navaja [naβáha] ~ [naβáxa] *razor*
113. narɸnhɸh < naranja [narřáŋha] *orange* plus hɸh *fruit*
114. negúřo < negro [néɣřo] *negro*
115. ohia- < ojear [oheáɾ] *to cast an evil eye*

116. paat < parte [páɾte] *share*
117. pʰáɾe < [páðre] *father, priest*
118. pʰaadíh *parsonage* < padre *father* plus díh *house*
119. padřinhóy < padrino [paðříno] *godfather* plus hóy *old man*
120. pag- < pagar [paɣář] *to pay*
121. pakúɾs < cruz [křús] *cross* plus páh *pole, tree*
122. pʰaka < vaca [báka] *cow*
123. palisád < palisada [palisáða] *debris blocking a river*
124. palitón < paleton [paletán] *toucan*
125. pandáu < pan [pón] in árbol del pan *bread fruit* plus dáu
126. pʰařól < farrol [fařól] *lamp*
127. pʰatkʰóna < plata [pláta] *plus* -kʰona *money*
128. patabál < tabla [táβla] *board*
129. patík < patica [patíka] *duck*
130. pʰia- < fiar [fiář] *to extend credit*
131. pjąhǫh < piña [píña] *pineapple* plus hǫh *fruit tree*
132. pilón < pilon [pilón] *mortar*
133. pilonhúa < pilon plus húa *hand*
134. pʰinsoldáu < fríjol, frisol [fɾisól] *beans*
135. pʰiésta < fiesta [fiésta] *feast*
136. pikét < tiquete [tikéte] *ticket*
137. polbó < polvo [pólβo] *powder*
138. ponee- < poner [ponéř] *to put*
139. prestaa- < prestar [pɾestář] *to borrow*
140. pulúm ~ pulumdáu < plomo [plomo] *lead, shot* plus dáu
141. púɾg < purgante [puřgónte] *purge*
142. pwertdíh < puerta [pwɛřta] *door* plus díh *house*
143. řašdíh < rancho [řáncho] plus díh *house*
144. řondaa- < rondar [řəndář] *to spy on*
145. saltdám < salto [sálto] *waterfall* plus -dam *diminutive suffix*
146. sabad?éd < sábado [sáβaðo] *Saturday*
147. sapotbíh < sapote [sapóte] *a fruit tree*
148. sapún < espuma [ɛspúma] *foam*
149. sařsía < sarcillo [sařsíjo] *earring*
150. sebóy < cebolla [seβója] *onion*
151. sentii- ~ sentía- sentir [sɛntíř] *to feel*
152. sepía < cepillo [sepíjo] *brush*
153. seřbii- < servir [sɛrvíř] *to serve*
154. seřkáu < cercado [sɛrkáo] *enclosure*
155. sía < silla [síja] *chair*
156. sínta < sinta [sínta] *ribbon, strip for tying*
157. sǫǫbéeř < sombrero [səmbřéřo] *hat*
158. sootík ~ sořtík < sortija [səřtíha] *fingerring*
159. talařsiɾ- < taladro [taláðřo] plus sir- *to turn*
160. talbéh < tal vez [talβés] *maybe*
161. tąɾąp < trampa [třómpa] *trap*
162. tąɾpíš < trapiche [třapíče] *sugar press*
163. tiendíh < tienda [tiénda] *store* plus díh *house*
164. tigřía < tigrillo [tiɣříjo] *tiger*
165. tʰoodíh < tolde [tólde ~ tóřde] *mosquito net* plus díh *house*
166. tomín < tomino [?][16] *ten cents*
167. tominumíh *twenty cents*
168. tořpéɾ ~ tořpéd < torpedo [tərpéřo] *dynamite*
169. třjjš < trincha [třínča] *ditch, barrier*
170. ?ú < o [o] *or*
171. yá < ya [já] *already*
172. yabméh < llave [jáβe] *key*
173. wanpanhǫh < guanábana [gwanáβana] *a fruit* plus hǫh *fruit*

[16] This word is not used in CSp today. It is cited by Pedro Mártir de Anglería, Décadas del Nuevo Mundo, 1530, p. 222: "por usar vocábulo que él pone el cual, en el lenguage de los banqueros contiene doce gramos."

NOTES AND REVIEWS

Some Remarks on the Spelling and Formation of Taino Words

Douglas Taylor

As our oldest record of a New World language (and perhaps also because, as C. H. de Goeje suggests, a number of its words has been adopted into the languages of Europe), the meagre and scattered remains of Taino have aroused enough interest to be compiled and commented on several occasions; but they have not, so far as I know, formed the subject of any serious modern study. Admittedly there is much more important linguistic salvage to be made; but the interested scholar does not always have the means of making it; and all is grist that comes to his mill.[1]

A prerequisite to any such study would be the assembling of all the different spellings and glosses of what presumably was intended to represent the same Taino form; identifying the recorder and dating the record wherever possible. Only then could those familiar with the historical phonologies of Spanish, Catalan and Italian make a shrewd guess at the phonetic values intended and the phonological oppositions involved. Unfortunately, de Goeje did not do this. Thus he cites only "aje, hage" for "aje, age, axe, ase, hage, haje" and possibly other spellings of the record; and sometimes 'normalizes', as in his "guaisa" for "guayça" and "daša" for "dacha" (but "machabuka" presumably as in the sources, except for the 'k'), without giving his reasons for doing so.

Letters	Total	Initial	Medial	Final
ç(a, o, u), qu	84 (1st)	30 (1st)	54 (1st)	0
n	73 (2nd)	8 (8th)	49 (2nd)	16
b	61 (3rd)	21 (3rd)	40 (4th)	0
t	51 (4th)	14 (4th)	37 (5th)	0
m	45 (5th)	25 (2nd)	16 (7th)	4
gu(a)	44 (6th)	25 (2nd)	19 (6th)	0
r	44 (6th)	0	42 (3rd)	2
h	40 (7th)	21 (3rd)	19 (6th)	0
g(e, i), j, x	29 (8th)	10 (6th)	16 (7th)	3
c, z, s-, -ss-	28 (9th)	10 (6th)	15 (8th)	3
y	23 (10th)	11 (5th)	12 (9th)	0
l	18 (11th)	2 (9th)	4 (12th)	12
d	10 (12th)	9 (7th)	1 (13th)	0
g(a, o, u)	7 (13th)	2 (9th)	5 (11th)	0
p	7 (13th)	2 (9th)	5 (11th)	0
ch	6 (14th)	0	6 (10th)	0

Lacking all but my own library facilities' the best that I could do was to restore and to supplement some of the original spellings, to list in alphabetical order some 218 words and names almost all from de Goeje's compilation, and to count the occurrences of the various letters and combinations of letters in word-initial, medial and final positions, with due regard to the divergent values of, for example, c and g before e or i on the one hand, a, o, u or a consonant on the other. Because of the frequency of such divergent spellings as: Cacibagiagua and Cazibaxagua, xagua and jagua, bixa and bija, ç (including ce, ci), z and s-, -ss- have been grouped together, as have also g(e, i), j and x; but I regard these groupings as a convenient working hypothesis only. Moreover, I am fully

[1] In his Nouvel examen des langues des Antilles (JSAP XXXI.1–120; Paris, 1939), C. H. de Goeje gives a list of Taino words and phrases taken, he says, from various editions of Columbus, Las Casas, Oviedo, Martyr, Chanca and Pane. Other or fuller references to some of the sources are: Gómara, F. L. de: Historia de las Indias (Zaragoza, 1552–53, and Madrid, 1749), Las Casas, B. de: Apologética historia de las Indias (Madrid, 1909), Navarrete, F. de: Colección de viajes . . . (Madrid, 1865–37), Oviedo y Valdés, G. F. de: Historia general y natural . . . (Madrid, 1851–55); Pane, Ramón, *in* Bourne E. G.: Columbus, Ramón Pane and the beginnings of American anthropology (*in* Proc. Amer. Antiq. Soc. n.s. vol. 17, pp. 310–48), Scillacio, N: Raccolta, Travesan: Raccolta (1501).

De Goeje says that compilations of Taino forms previous to his own were made by Gilij, Rafinesque, von Martius, Richardo (Pichardo?), Brinton, Tavera-Costa and Zayas y Alonso.

aware that some later sources may employ 'j' for [h], and some early sources employ initial 'J' for [i] or [j], and that even when all possible precautions have been taken, the figures so obtained will be too low to be of much statistical value.

Twenty-eight of the words in this count have initial vowel (19 a, 5 i, 2 e and 2 o). Medial occurrences of the above-listed letters are intervocalic except for the following nine clusters, each of which was found only once: lb, rb, rc(a), cr, dr, nr, nh, st, ct. It should be noted that m and n in word-final are written in several instances for the same word (e.g.: cibucam, cibucan); and may therefore represent an undifferentiated velar nasal, or even vowel nasalization. A suffix -el, said to mean *son of* accounts for 8 of the 12 occurrences of final l.

If we look only at the totals, we are first struck by the 'eminence' of k-sounds, and by the apparently considerable break in frequency of occurrence between h and g(e, i), etc. Both Lokono and Island Carib have an attributive prefix KA- and a verbalizing suffix -ka; and there is reason to suspect the presence of similar affixes in Taino. So, for example, the second element of T buti-caco *blue-eyed* apparently contains cognates of this prefix and of Island-Carib áku (Lokono akusi) *eye(s)*; while T ahiacauo *let us tell* probably contains a cognate of the suffix. And there is some suggestion that Taino may have had only one sibilant (or assibilant?) phoneme, such as, for example, the spelling "ase" (Alonso Enríquez de Guzmán, 1534), as well as "axe, hage',, etc., for what looks like a cognate of Goajiro haiši and Lokono haliti or halite *sweet-potato*. In this word, and in that meaning *capsicum* ("axi, aji"), x or j of the written Taino form corresponds to /t/ of Lokono (hati) and of Island Carib (áti), to /š/ of Goajiro (haši); but elsewhere both x, j (or ge, gi) and ç, z (or s-, -ss-) of the Taino record (cf. Cacibagiagua and Cazibaxagua, both representing the same name of a grotto) correspond to /s/ of Lokono and /s/ of Island Carib (the latter phoneme usually but non-distinctively hushing in the early dialect of Dominica, and hence written 'ch' by Breton). So: Taino "bixa, bija" and Island-Carib "bíchet" *anatto* (*Bixa orellana* L), T "hibiz" and IC "hébichet" *sifter*, T "xagua, jagua" and IC "chaoua" *genipa*, T "xagueye, jagueye' *natural cistern* and IC "chaouai" *rocky coast, cave, grotto*, T "cemí, zemí" and IC "chemíin, cemíin" *God or spirit*, T "ciba" and Lokono /siba/ (cf. IC "ichíbani" *rock used as anchor*) *stone*. Should Taino have had only one sibilant, like Lokono and early Island Carib, this phoneme would appear to have had a frequency of occurrence intermediate between those of b and t; leaving a still greater gap between h and y.

Most striking when we look at the distribution is the absence from initial position of r, which ranks high medially, and the quasi-absence of medial d, found only in the cluster dr in the name of a mythical being, Giadruuaua. Moreover, while medial r of Taino apparently corresponds to medial d of Lokono (and to r of Island Carib), as in "guarocoel": L uaduku(n)ti (IC uárukuti) *our grandfather* and "buren": L budali (IC búrelet) *cassava griddle*, initial d of Taino corresponds to initial d of Lokono at least in "dacha" (or "daca"): L dakia *I*. Should the Taino sounds written d and r have belonged to one and the same phoneme, this would take its place, with a more normal distribution, between b (or the sibilant, should there be only one) and t. But whether these Taino sounds were or were not in opposition, their known distribution and correspondence indicate a stage of development intermediate in this respect between that of Lokono and that of Island Carib (whose r corresponds either to d or to r of Lokono in both medial and initial positions).

Such alternative spellings as "guamechyna" and "guamiquina", "dacha" and "daca" suggest that 'ch', which was not found in initial position, was a variant of k before a high front vowel; so that "dacha" may have been phonologically identical with its cog-

nate Lokono equivalent, dakia. And if so, the "garrucha" or *spear-thrower* of the Taino may have been phonologically *kadukia, and possibly related to Lokono kaduk-un *"im Schoos, oder auf den Armen haben"*.

Only two reliable cognates of Lokono forms containing r appear in my Taino list: mahiz *maize* and mahite *toothless*; and here Taino h corresponds to r of Lokono and of Island Carib alike: márisi *maize* and ári *tooth, teeth* of both the latter languages. T mahite contains moreover cognates of privative mA- and subordinative -te; both affixes that are common to Lokono, Island Carib and Goajiro. But then, in T "ahiacauo guarocoel" *let us tell our grandfather*, h of the first word and r of the second apparently both correspond to d of Lokono (adiaka *speak, tell, say*; uadukunti *our grandfather*) and to r of Island Carib (arɟaka *speak, tell, say*; uárukuti *our grandfather*).[2]

It would appear from my count that Taino m is, proportionately, about three times as frequent in initial as in medial position, and that the reverse is true of Taino n. Moreover, all 25 occurrences of initial m are followed by the low vowel, a; and since mA- is a private prefix, we might expect it to be represented here more than once. So, a comparison with Lokono and Island Carib makes it likely that Taino "manicato", said to have been uttered by a Haitian bride after having been successfully "probado" by the male guests at the wedding, meant *she is forbearing, patient*, or, possibly, *it does no harm*, and Taino Matinino (the name of the mythical island of women, identified by some with Martinique) *the fatherless*, the latter containing, like the words "tayno" and lokono, -no *plural human*. And it would seem that Taino, like Lokono, had several other common suffixes containing n.[3]

Similarly, the sequence "gua"—which I take to represent [ɣa] in at least some of its occurrences—is proportionately more than twice as frequent in initial position as elsewhere; and since, in the form meaning *our grandfather* (see above), it appears to form a prefix cognate with Lokono and Island-Carib uA- (Goajiro wA-) *we, our, us*, it seems highly probable that it had the same function also in Taino "guatiao", which is glossed, indifferently with "datiao", as *amigo, compañero*. Comparison of the latter with T "dacha" *I* and with such a Lokono possessed noun as dadukuti *my grandfather* leads to the conclusion that T datiao means *my friend* and contains, together with a stem cognate with Island-Carib -tɨaɥ, as in uatɨaɥ *our friend*, a prefix cognate with Lokono dA- and Goajiro tA- *I, my, me*. Since most Arawakan languages have instead a prefix nV- with this function, the forms in an apical stop must be an innovation that Taino shares only, so far as I know, with Lokono, Goajiro and Paraujano.

Perhaps this as much as can legitimately be gathered from my very incomplete survey of the spelling of Taino forms in the various sources in which they were recorded. But I

[2] Taino "bagua" and Lokono bara, meaning *sea*, certainly seem to be cognate; but when they are compared to other cognate equivalents, such as Island-Carib baláua (also balána) *sea*, it is seen that each of the former languages omits one and a different syllable of the latter word, so that we cannot speak of a correspondence here to Lokono r. In Taino: "ocama guaxeri guariquen caona yari" (Zayas, p. 470), said to have been "usada por una India de Haiti para decir a su principal o encomendero que mirase una veta o piedra de oro", T caona is certainly cognate with IC káuana *gold*, T yari with IC ɟari or ɟari *ornament, jewel (beads or necklace)*; but this last word appears to have no cognate in Lokono.

[3] Cf. Taino "atabaene nequen" *sati (wife who agreed to be buried alive with dead husband)*, 'Burenquen' *Puerto Rico*, 'guariquen' *earring* (?), 'henequen' *'hemp'* (*so-called*; an Agave or a Bromelia from which thread and cord were made), Duiheyniquen or Duyheiniquem, a river name (compare L uinikan *river, creek*, containing uini *water* together with a diminutive -kan). If the first of these forms should be related to IC taba- *go down* (*of sun, moon*, etc.) and enéneri *wife*, it should be differently spaced: ataba-eneneken. The name for Puerto Rico appears to contain buren *cassava griddle*. If guariquen is related to IC aríkai and L adike *ear(s)*, it probably contains uA- *we, our, us* and a suffix (?) -n.

am convinced that a more thorough-going study of this sort would be rewarding. For instance, it might be possible to confirm or to disprove the nondistinctive character of 'x' ('j', 'gi', 'ge') and 'ç' (z, s-, -ss-) and (or) of 'd' and 'r'; or to discover the environments in which Taino 'n' corresponds, if it does, to /l/ of Lokono and (or) of Island Carib, as appears to be the case in the words for *cassava griddle* (see above), in T "guanabana" and Island Carib ualápana *soursop*, and elsewhere (cf. T "aon" and IC ąuli *dog*, T "hyen" and IC ɲhali, L keheli *manioc juice*, T mani and IC mąli *peanut*, T "canima", "caniba" or "canibal" and IC kalípuna, L kalipi-di/-du/-na *Carib*).

And if the word "tayno" meant *"bueno"* (Navarrete) or *"nobili"* (Travesan), did the equally common recording "nitayno" mean *his nobles* (in reference to the cacique), and contain a prefix cognate with Goajiro nV- *he, his, him*, which latter is equivalent to—if not cognate with—lV- of Lokono and of Island Carib? One would also like to find a meaning for Taino "naboria", said to designate the lowest caste or class; and if Lokono -budia, glossed by de Goeje as *"a small remnant"*, may be translated *remainder, rest*, it seems not unlikely that this Taino word should contain a cognate of the Lokono stem together with a prefix cognate with Lokono and Goajiro na-*they, their, them*, and have meant: *the rest of them.*

Dominica, British West Indies

A Note on Tanaina Subgroups[1]

H. A. Gleason, Jr.

In IJAL 26: 120–122, Herbert J. Landar discusses the subgrouping of Tanaina on the basis of a lexicostatistical treatment of Osgood's data. The article is particularly useful in that the data is available, and Landar's interpretation of it is clearly stated. It provides an opportunity to subject the same material to other lexicostatistical treatments,[2] and to compare the results. It should be borne in mind that the following calculations are made from Landar's cognation table, and do not, therefore, raise any question about his identification of cognates. The only point under discussion is the relationship between the results of one method of counting and another.

If a count of counterindications is made, the following tabulation results:

Bay					
3	Kenai				
19	20	Tyonek			
41	39	31	Susitna		
41	40	31	3	Upper Inlet	
13	14	12	31	30	Iliamna

The meaning of these figures is that if Bay and Kenai are taken to be immediately related, 3 items in the corpus will require special explanation (borrowing or parallel innovation), whereas if Bay and Susitna are so taken, 41 will require special explanation. There are two clear minima, Bay-Kenai 3 and Susitna-Upper Inlet 3. These may be taken to indicate that these two pairs should be considered as immediately related. Tyonek-Iliamna 12 is also a minimum, but a most precarious one compared with Bay-Iliamna 13. It is doubtful that a difference of this magnitude is significant, so it should be disregarded.

The characteristic vocabulary index[3] confirms these conclusions strongly:

Bay					
20.3	Kenai				
9.6	8.7	Tyonek			
2.4	3.9	7.5	Susitna		
2.5	3.1	6.5	31.4	Upper Inlet	
7.2	6.8	11.2	2.8	3.3	Iliamna

[1] This work was supported in part by the National Science Foundation.

[2] Gleason, H. A., Jr. 1959. Counting and calculating for historical reconstruction. AL 1, no. 2, 22–32. See also Gleason, H. A., Jr. Genetic relationship among languages (to be published by the American Mathematical Society in the proceedings of the 1960 symposium on Language Structure and its Mathematical Aspects).

[3] I would like to reiterate that this term is unsatisfactory and is here continued in use only in default of a better.

These figures are in effect a count of similar items weighted heavily in favor of those least widely shared. There are very pronounced maxima for Bay-Kenai 20.3 and Susitna-Upper Inlet 31.4. These indicate immediate relationship for these pairs. Tyonek-Illiamna 11.2 is a weak maximum compared with Bay-Tyonek 9.6, and is probably of no significance.

These results are consistent with one another and with Landar's results. Either of the above tabulations, however, gives a sharper indication of Bay-Kenai and Susitna-Upper Inlet immediate relationship than does a simple count of shared cognates. This is because, particularly with the method of counterindications, they focus simply on the questior of immediate relationship, whereas the shared cognate count focuses on degree of relationship in some, perhaps only approximate, metric sense.

If these two pairs of languages are put together, we have four branches whose relationship can be further investigated. As a first step a new cognation table must be set up. For example, when Bay and Kenai have the same form, this can stand for the pair. Thus A A A B B B 'crane' becomes A A B B. When they differ but one form is unique, the latter can be disregarded. Thus A B A A A A 'potlatch game' becomes simply A A A A. Since B is found only in Kenai, we must consider that it represents an innovation subsequent to the Bay-Kenai unity, and hence that the form characteristic of the branch is A. A set like A B B B B A 'moose' presents a different problem. Since A is shared by the Bay-Kenai branch with Iliamna while B is shared by Bay-Kenai with the remainder, we cannot so facilely identify the innovation. We must enter the set in the new cognation table as A/B B B A. The new cognation table is as follows (the order of items is identical with that in Landar's table, so direct comparison can be made):

	B-K	T	S-U	I
1	A	A	A	C
	A	A	A	C
	A	A	B	B
	A	A	B	B
	A	A	C	C
	A	B	A	B
	A	B	A/B	A
	A	B	A/B	A
	A	A	A	A
	A/B	A	A/B	A
	A/B	A	B	B
	A/B	B	B	A
	A	C	C	E
2	A	B	B	C
3	A	A	A	A
	A	A	(B/C)	A
	A	B	B	B
4	A	A	A	A
	A	A	B	C
	B	B	B	B
5	A	B	B	A
	A	B	C	B
14	A	A	A	B
17	A	A	B	A

Forms listed as A/B can be counted in two ways. In the following tables totals have been given for both maximum and minimum counts. As can be seen, this does not seriously alter the picture.

Counterindications:

Bay-Kenai			
6/9	Tyonek		
8/12	4/7	Susitna-Upper Inlet	
4/7	8/11	6/9	Iliamna

Characteristic Vocabulary Index:

Bay-Kenai			
19.0/20.3	Tyonek		
6.3/8.3	15.3/14.3	Susitna-Upper Inlet	
12.7/13.3	14.7/15.0	5.0/4.7	Iliamna

These figures are quite ambiguous. There is a weak indication in favor of (Bay-Kenai)-Iliamna and Tyonek-(Susitna-Upper Inlet) in the table of counterindications, and fairly strong evidence against (Bay-Kenai)-(Susitna-Upper Inlet) and (Susitna-Upper Inlet)-Iliamna in the second table. Not only

is there no clear result in either tabulation; the two are not in agreement in what indecisive hints they do provide. It would be well to see why it is that the result is so uncertain.

Landar examined 185 sets. Of these 108 had the same form throughout the six dialects, and therefore had no evidential value for subgrouping. He rightly omitted them from his table, and rested his investigation on the 77 sets which were not uniform throughout. Actually, not all of these are equally good. Of minimum value are sets like A A A A A B, consisting of 5 cognates and one unique form. Such sets comprise 26 of the total of 77. Sets of 5 cognates contribute very little to the characteristic vocabulary index. Only sets which contain two different cognate sets, each containing two or more items have any use whatever in the method of counterindications. The count of counterindications is, therefore, based on only 35 glosses, not 77. Nevertheless, with this small number it gives a clear indication of the first level of subgrouping.

It is interesting to see what happens to these 77 sets when the new table is set up for the second level investigation. 12 become identical throughout and have no further evidential value. 39 have one set of three and one unique form, and are of minimal value. 12 have one pair and two unique forms, and are of some small value in computing the characteristic vocabulary index. 5 have one or more ambiguous (A/B) items and have limited value. Only 9 consist of two pairs. These 9 must carry the greater part of the burden of sub-grouping at the lower level. This is a very slender base.

A simple count of cognate pairs makes use of the data in a quite different way, and seems at first sight to avoid this attenuation of the base as deeper levels are reached. This is partly only an illusion, since there are compensating difficulties. These lie largely in the area of chance variation. At deeper time-depths, random variation becomes important even when no temporal measurement is involved. (Landar quite rightly does not read time from his quite uncalibrated gloss list, but his table is meaningful only as a nonevaluatable indication of time — lower percentages mean greater time of separation. All the statistical uncertainty of glottochronology is present except the uncertainty of calibration.)

As a matter of fact, Landar's tabulation does not make the relationships any clearer. His figures (with one typographical error corrected) regrouped to bring out their application to the second level of subgrouping follow:

Bay-Kenai			
53,55	Tyonek		
22,22,26,27	36,37	Susitna-Upper Inlet	
37,39	42	15,16	Iliamna

It will be seen that the first-level grouping of Bay-Kenai and Susitna-Upper Inlet is justified not only by the higher count of cognate pairs (68 and 58), but also by the approximately equivalent counts between the united dialects and others. If, however, following this table Bay-Kenai and Tyonek are put together, there will be no such uniformity; the count of this group against Susitna-Upper Inlet will vary from 22 to 37. Or again, there is no way to fit the low count for (Susitna-Upper Inlet)-Iliamna into a genetic tree which will not run counter to the much higher counts for Tyonek-Iliamna and Tyonek-(Susitna-Upper Inlet). That is to say, the shared cognate count given by Landar does not provide a genetic tree at the lower level either.

Perhaps more data, which might produce more word-sets useable at the deeper depth, would enable us to set up a workable genetic tree. But of this there can be no guarantee. If it does not work out so, this is merely another instance of a group of speech forms where the Stammbaum hypothesis is not completely adequate. Since our commitment to this hypothesis is merely a methodological one, as the most convenient device

for preliminary reconstruction, we need not be surprised at this result. Reconstruction will have to proceed on the assumption of a four-way split. This might prove later to require emendation, of course. But lexicostatistical methods are always to be taken as simply devices for preliminary work. They fail in making the assumption—absolutely necessary at the stage where they are applied—that all differences are of equal historical value. Subsequent work invariably shows that they are not.

HARTFORD SEMINARY FOUNDATION

A NOTE ON ACCEPTED AND REJECTED ARRANGEMENTS OF NAVAHO WORDS[1]

HERBERT J. LANDAR

1. Reverse translation, from English to target language, was used in Southwest Project semantic differential research, together with primarily directive eliciting of utterances, in a search for scalar opposites.[2] Selection of concepts to be rated on various scales and composition of scales was undertaken by researchers with psychological and anthropological competence—Carroll, Osgood, Suci, Casagrande, Ervin, and others—but initial contact with each target language involved linguistic analysis, basic and in the main directive.

Project studies, as in the case just cited, were not linguistic in a narrow sense, but centered upon problems in the psychology of language. Some of the linguistic research supporting these studies, however, is of methodologic and lexicographic interest. The present note concerns such research as related to the assessment of meanings, in connection with semantic differential testing.

2. In the exploration of the meanings of verbs which had been selected tentatively for use in experimental scales, a matrix crossing scalar verbs with forms chosen as concepts produced combinations and associations which illuminate features of Navaho culture.

Concepts: (1) cídii *bird*, (2) dił *blood*, (3) bínaaí *his older brother*, (4) k'os *cloud, sky*, (5) mą?ii *coyote* (used in reference to the animal and as a curse word), (6) łeež *soil, earth*, (7) čąą? *feces, belly*, (8) binest'ą? *its product*, (9) ?at'éed *girl*, (10) bicii? *his hair, his head*, (11) yaa? *louse*, (12) ?abe? *milk, breast, udder*, (13) ʒił *mountain*, (14) ?aziz *penis*, (15) nahałtin *it rains, rain*, (16) šéé? *saliva*, (17) ?aɣoš *sleep*, (18) ƛ'iiš (used in reference to the reptile and as a curse word), (19) sin *song*, (20) na?ašʒé?ii *spider*, (21) cé *rock, cliff*, (22) ʒóxoona?éí *sun*, (23) ?adi?ní *it thunders, thunder*, (24) cin *tree, wood*, (25) tó *water*, (26) be?esʒą *his wife*, (27) ?asʒąą *woman*, (28) naa?ahóóhai *chicken*, (29) gohwééh *coffee*, (30) ?azee?al?į *hospital*, (31) béeso *money* (paper or coin), (32) ?éé?níšoodí *priest, missionary* [derived from a relative expression, *the one who drags his garment*], (33) siláago *soldier, policeman*.

Scalar forms: (a) yilžólí *it is soft, fluffy, limp*, (b) nážah *it is U or L shaped*, (c) bídéeltǫ? *it is slippery, foot-betraying*, (d) t'óóbaa?ih *it is dirty, filthy, awful*, (e) nómaz *it is spherical, globular*, (f) ničxǫ́ǫ́?í *it is ugly, filthy, unbeautiful*, (g) nižóní *it is pretty, nice, clean, beautiful*, (h) niteel *it is wide, broad*, (i) sək'az *it is cold*, (j) siƛéé? *it (mushy substance) is in position*, (k) sido *it is warm, hot*, (l) šibéézž *it is done, cooked by boiling*, (m) dǝ́kǫ́ǫ́ž *it is brackish*, (n) dilč'il *it is popping, clicking*, (o) dinilgai *it is whitish (with some tinting)*, (p) dinilbá *it is grayish, lavenderish*,

[1] Data presented here were collected in Arizona and New Mexico chiefly during work of the Southwest Project in Comparative Psycholinguistics in 1955–56. The matrix of section **2** is based on work with a bilingual in his twenties from the western part of the reservation. I am grateful to the Social Science Research Council for a fellowship and to the Department of Public Health and Preventive Medicine of Cornell University Medical College for assistance which facilitated the preparation of this note.

[2] On the semantic differential, see Charles E. Osgood, George J. Suci and Percy H. Tannenbaum, The Measurement of Meaning (Urbana, 1957), esp. pp. 31–124. Navaho scalar opposites involved not adjectives, as in English, but verbs; cf. *rough-smooth*: dəʒol [*it is rough*]-dilkǫǫh [*it is smooth*].

(q) dinilco *it is yellowish, orangish,* (r) dinilčíí? *it is reddish, pinkish,* (s) dic'id *it is tough, sinewy,* (t) dic'oz *it is hairy, has dangling hair,* (u) dinoolλ'iž *it is bluish, greenish, purplish,* (v) dooλ'iž *it is blue, green, purple,* (w) yá?át'ééh *it is good, suitable, all right,* (x) yilzą́h *it is loosened,* (y) nineez *it is long, high.* This is not a complete list of the forms which were investigated, but it is a sample adequate for this note.

A matrix with forms represented along two axes by number and letter can be constructed from data presented below. In such a matrix an empty cell would indicate rejection of an arrangement, and a plus sign would indicate an acceptable arrangement. One can tell from the following matrix, for example, that cídii yilžólí *the bird is soft* is acceptable and that dił yilžólí *the blood is soft* and cídii názah *the bird is U or L shaped,* though grammatical sentences, are not.

	a	b	c
1	+		
2			+
3	+		

The size of such a matrix, unfortunately, would make it cumbersome. This fact, together with a desire to indicate parenthetically the associations brought forth by acceptable arrangements, has led to the indication of arrangements thus:

1 bird: a, d (of a dead bird), f, g, l, o (e.g. a swan), p, q, r, s (of a bird's meat; dic'id usually refers to rope-like objects, stringy, strong, resistant to breaking, strain, or pulling, and to tough meat), u, v, w.

2 blood: c, d, f, g (clean, pure, without alcohol or syphilis), i, j, k, l, m, r, w.

3 his older brother: a, d (he has body odor), f, g (he's handsome), l, r, s (a metaphor), t (humorous, of a body entirely covered with hair except for a few bare spots), v (of a person who is blue all over, e.g. from choking on a bone), w.

4 cloud, sky: g, o (with lots of gray in it), p, r, v (blue, a ceremonial color, not green or purple), w.

5 coyote: a, f, g, l, o (very light brown), p, t, u (a bluish variety [perhaps the desert fox, *Vulpes velox*]), w.

6 soil, earth: f, g (of the painted desert in Arizona, or of good soil), h, i (of frozen soil), j (of mud), k, l (of the bubbling up of sand in a fire pit in which there is a fire), m (of desert soil with alkali), o (any tint, as tints of the painted desert), p, q, r, u (bluish, greenish, or purplish, as on the painted desert), w, y.

7 feces, belly: a, b (laid out on the ground in U or L position), d (of feces), f, j, k, q, v (of the front of the torso below the navel, with reference to an area marked by swelling and a network of blue-green veins, while the rest of the body is bony and skeleton-like, during starvation), w.

8 its product: a, f, g, o (e.g. turnip white), p, q (of lemons, peaches, oranges), r, u (greenish, as a honeydew melon), v (green), w.

9 girl: a, d (of a dead girl), f, g (she's beautiful), q (of a very young blonde girl, with reference to her hair), r, v (blue as from choking), w.

10 his hair, his head: a, f, h, p, q (of blonde hair), r, s (of vigorous hair, as opposed to the brittle hair of an old person or to dead hair), t, w, y.

11 louse: a, f, q (grayish white), p, r, w.

12 milk, breast, udder: d, e (of breasts), f, g (of a girl's breast), i (ice cream), k, l, (the arrangement 12-o was rejected, because "milk is too white to be dinilgai"; dinilgai denotes not 'cream-colored' but rather more white than any other color which tints it—and there may be a tinge of any other color, green, grayish, brown, purple; moreover, milk tinted reddish from blood is not dinilgai but dinilčíí?), r (of bloody milk: sometimes a lamb, with the ewe's nipple in its mouth, jabs its nose at the udder to stimulate the flow of milk; insistent and continual jabbing may cause injury resulting in bloody milk; the lamb may then be taken away to save the ewe), t (of the mammary apparatus of a canine of a variety in

which hair covers all but the nipples), v (of the breasts of a choking person), w.

13 mountain: f, g, p, r (in the fall), u (of a bluish mountain in the distance), v (blue, green, purple), w.

14 penis: a, d, f, o (of a penis when it is cut off and all the blood runs out and it gets pallid and whitish), p (maybe), r, s (of the raw pizzle of a bull, as opposed to a cooked pizzle, which breaks easily), t (of a bull's pizzle, though diX'o *it is hairy* is more usual in this connection), w, y.

15 rain: c (of falling rain), i, v (blue, a ceremonial color, not green or purple), w.

16 saliva: c, d, j, s (of the drool of a cow exhausted from running about five miles, and thirsty; the saliva hangs in several gooey, sticky, clear strings that break off halfway down to the ground), w.

17 sleep: g.

18 snake: a, d, f, g (of a snake looked at without recognition of its evilness), h, i, o (of a snake's greenish white belly), p, r, s, u, w.

19 song: f, w.

20 spider: a, d, f, p, r, u, v, w.

21 rock, cliff: a, e, f, g, h, i, k, m, p, q, r, w.

22 sun: e, g, k, r (of the sun behind a cloud).

23 thunder: d, v (blue, a ceremonial color, not green or purple).

24 tree, wood: a, f, g, h, i, n (of willow branches in a campfire, popping very fast, t-t-t-t-t...t-t-t, throwing off embers of bark some twenty feet—a danger to sleepers in their blankets round the fire), o (of a tree with whitish bark and leaves whose undersides are a whitish color), p (of a dead tree), r (of a redwood stick; never of a tree), v (green), w.

25 water: c, d, f, g, i, k, l, m, o (of water muddy with white clay), r (of water muddy with red clay), u, v, w.

26 his wife: a, d, f, g, v (blue e.g. from choking on a bone), w.

27 woman: a, d, f, g, v, w.

28 chicken: a, d, f, g (of a good healthy chicken), k, l, o (of some kinds of chicken), p, r (of some kinds of chicken), s (of dressed meat).

29 coffee: a, f, k.

30 hospital: f, g, r (of a hospital with a red tile roof and red bricks).

31 money: a, v (green), x (of a dollar bill, much handled and limp. A treatment by which something hard is made very soft or loose is involved, e.g. the tanning of a deer hide [which makes the hide very soft], but not the tanning of a cow hide [which does not make the hide very soft]), y.

32 priest, missionary: a, d, f, g, t, v.

33 soldier, policeman: a, d, f, g, t, v.

3. This illustration is interesting in several ways. It suggests that psycholinguistic research centered upon a given problem may serve linguistics and ethnology as well as psychology. The Voegelins have observed: "An interdisciplinary team of psychologists, linguists, and anthropologists, under the auspices of the SSRC (Southwest Project in Comparative Psycholinguistics) began work in 1954 formulating hypotheses (in some of which the bilingual speaker's languages are taken to be the only variables—hence relevant to linguistic relativity as stated by Whorf), and testing hypotheses among monolingual and bilingual Hopi, Zuni, Navaho, Spanish - Americans and Anglo-Americans in the Southwest. It will be interesting to see, after the project publishes its main results, whether or not reverse translation is used in psycholinguistics (as in 1.1., above); and whether eliciting is mainly directive (as in 1.2.), or mainly nondirective (as in 1.3)."[3] In semantic differential research, at least, both reverse translation and directive eliciting are important.

The immediate value of the matrix approach to psychologists bent upon measuring connotative meaning has already been touched upon. The results of psychological experimentation sometimes give direction

[3] C. F. and F. M. Voegelin, Selection in Hopi Ethics, Linguistics, and Translation, AL 2:2.48-78 (1960), p. 52.

to ethnographic research and help in the framing of hypotheses.[4] Another contribution of psychological research across disciplinary lines, it appears, stems from the definition of meanings in terms of combinatory privileges.

It is no secret that speakers find out what a word means by observing language in use, and by extracting features common to the situations in which a word appears. Meanings vary as the experiences of speakers vary. Trivial differences in meaning attach to relational elements, e.g. Navaho ʔéí *that*, dóó *and*, ɳ̀di *but*. In the case of what Sapir calls concrete concepts, however, meanings may vary through use in sharply different ways. Meanings may also vary because of the use of forms in special contexts that discourage free inquiry. An informant's uncle had taken his wife's sister because his wife was "čooγin"; the informant, married and in his twenties, remembered the situation involving his aunt and her sister, but did not discover until I told him that čooγin means *menstrual flux* (cf. čooγin nišł *I am menstruating*). Navaho society is largely bookless (cf. naalcoos *paper, letter, envelope, book, newspaper, magazine, photograph*, with stem -coos encoding a flat flexible object); the informant in question usually consulted his father about the meanings of words, but apparently pressures of Navaho social life cause some questions to abide for years. On the other hand, queries about usage sometimes lead to discussions and reflect a desire for a prescriptive solution. Thus once I asked a girl in Tuba City what sizáanii means. She said *my male clan relatives* but was uncertain. She called some other Navahos together and opinions were compared. A man from Many Farms insisted knowingly that sizáanii (without the possessive prefix, sáanii) used to mean *my female clan relatives*, but nowadays is coming in for *my wife*. Given this kind of indeterminacy, a ready acceptance of meanings assigned by one informant may be as undesirable as systematic studies of the linguistic contexts of words are desirable.[5]

No one, much less a Navaho, tells all. Censorship and caprice are to be expected, as well as memory lapses, when 'permitted' arrangements of words are being studied. But in asking about possible combinations of nouns and verbs, certain aspects of life and experience, alien to the investigator, were discovered. The method of elicitation by matrix, illustrated here for Navaho, therefore recommends itself as allowing at least a partial escape from culture bondage, and more sensitive reporting of lexicographic data than might otherwise be possible. The results are interesting not simply because we are given probable arrangements. Absences (see my note, IJAL 26.75–77 [1960]) are also significant in the study of culture. One wonders, referring to the matrix, why the sun and thunder, for example, are neither *good* nor *ugly* when so many other things are. Perhaps further, primarily ethnographic, study will tell why.

NAVAJO CORNELL CLINIC

[4] Navaho semantic differential results have stimulated research which concerns the theme of motionful activity. See my Four Navaho Summer Tales, JAF 72.161–64, 248–51, 298–309 (1959), esp. pp. 303–306, wherein semantic differential results are related to this theme.

[5] Studies whose emphasis is primarily pragmatic are also desirable; cf. Clyde Kluckhohn, Some Navaho Value Terms in Behavioral Context, Lg 32.140–45 (1956).

TURNER JUBILEE VOLUMES I AND II. Ed. by Sukumar Sen. Indian Linguistics [vols. 19 and 20.] Madras, Linguistic Society of India, 1958–59. xii, 375 pp.; x, 240 pp.

WILLIAM BRIGHT

In 1958, the Linguistic Society of India proposed a Jubilee Volume to celebrate the 70th birthday of Sir Ralph Turner, former director of the School of Oriental and African Studies, University of London, and outstanding scholar in the modern Indo-Aryan languages. The number and variety of the papers submitted, however, were such that

not one volume, but three, are being published in Sir Ralph's honor. The first two of these are now at hand.

These volumes, like other recent publications of the Linguistic Society of India, are printed attractively and accurately, in considerable contrast to many earlier scholarly publications from India. More important, however, is the evidence these volumes provide of the vitality and quality of linguistics in India today. Following 1953, when the Rockefeller Foundation began support of the linguistics program at Deccan College, Poona, Indian linguistics has grown rapidly, finding ever-increasing support from universities and governmental agencies. Linguists from America, from England, and from several other countries have done teaching and research in India, contributing to this development. It is especially gratifying to see such a renaissance in the native land of Pāṇini, whom linguists may well regard as the founder of their science.

Besides articles in the traditional fields of Indic philology, the Turner Jubilee Volumes contain a substantial number of structural studies. In the historical and comparative fields, special mention may be made, in Volume I, of Final Stops in Korku and Santali, by N. H. Zide (pp. 44–48); Phonetics and Phonemics in Historical Linguistics, by A. M. Ghatage (pp. 182–87); and Proto-Dravidian *ʐ, by Bh. Krishnamurti (pp. 259–93); and, in Volume II, of Gender of Loan Words in Hindi, by J. Burton-Page (pp. 165–79). Important descriptive articles in Volume I are Duration, Syllable and Juncture in Gujarati, by P. B. Pandit (pp. 212–18); The Marathi 'Compound Verb', by Ian Raeside (pp. 237–48); and The Tamil Occlusives: Short vs. Long or Voiced vs. Voiceless? by Leigh Lisker (pp. 294–301). The Jaffna Dialect of Tamil: a Phonological Study, by K. Kanapathi Pillai (pp. 219–27), though not stated in modern terms, provides valuable data from the historically significant dialect of Tamil spoken in Ceylon. In volume II, noteworthy descriptive work appears in The Kannada Verb: Two Models, by H. S. Biligiri (pp. 66–89); The Category of Case in Marathi, by Ashok R. Kelkar (pp. 131–39); and Telugu Vowel Phonemes, by Gerald Kelley (pp. 146–58). The descriptive articles deal, on the whole, with colloquial style, and thus represent a most welcome departure from the long tradition of presenting South Asian languages only in their formal or literary varieties.

The influence of American linguistics is apparent in many of these papers. Of the Indian linguists named above, Ghatage, Krishnamurti, Pandit, Biligiri, and Kelkar have all studied in the United States. The paper by Biligiri is of particular interest in being (as far as I know) the only published attempt to analyze a single body of data according to the two models, Item-and-Process vs. Item-and-Arrangement, suggested by Hockett.[1] Biligiri's description also provides an interesting contrast with my own recent grammar of Kannada.[2] As a native speaker of the language he is describing, Biligiri notes some verb forms overlooked by me: the "negative contingent" forms such as ma:ḍla:re *I may not do*, and the peculiar "maledictive" form exemplified by nin-mane bi:ḷa *may your house fall down!* On the other hand, the lack of a general concept of Kannada structure in Biligiri's paper results in a certain arbitrariness in his analyses of verb forms. To cite one example, Biligiri analyzes ma:ḍolla *doesn't do* as ma:ḍ- *do* plus -ol *negative habitual* plus -la *negative*; his morpheme -ol occurs only with following -la. Opposing this view, I would point out that if the emphatic enclitic -e: is added to this expression, the result is ma:ḍode: illa *never does*, and that in fact a common variant of ma:ḍolla is ma:ḍod-illa. Here it becomes apparent that

[1] C. F. Hockett, Two Models of Grammatical Description, Word 10.210–31 (1954).

[2] An Outline of Colloquial Kannada, Deccan College Monograph Series no. 22 (Indian Linguistics Monograph Series no. 1), Poona, 1958.

the free form illa *no* is present, and the balance is identifiable with the "verbal noun" ma:ḍodu *doing*—which is not mentioned in Biligiri's description.

In Jubilee Volume II, Indian Linguistics is added to the growing list of media for the phonemic restatements of Eric P. Hamp. In his Lushai Syllables (pp. 238–40), Hamp reworks the phonemic system of Lushai as presented (from two slightly differing dialects) by Robbins Burling and by me.[3] His suggestion that tone may be used to define syllable boundary is well taken; I would accordingly rewrite thlà-thár *new moon* as thla'thar', ʔá-thràa *it's good* as ʔa'thraa'. On two points, however, I would disagree with Hamp. In "my" Lushai dialect—and, I strongly suspect, in Burling's as well—there are no utterances beginning with a vowel, but there are many utterances beginning with glottal stop followed by vowel. As often seen in the similar cases of Burmese and Siamese, speakers of European languages have a tendency either 1) not to hear the glottal stop at all, or 2) to deny it phonemic status. The result in either case is a notation with utterance-initial vowels, like Burling's and Hamp's for Lushai. My contention, on the other hand, is that [ʔ] is as plainly an utterance-initial of Lushai as is [k], and that it therefore contrasts with utterance-initial [h]. Syllable-final [ʔ] must then be united phonemically with the initial [ʔ]; Hamp is no more justified in treating [-ʔ] as a co-allophone of [h-] than he would be in treating it as a co-allophone of [k-].

Secondly, the question arises in Lushai whether phonetic complexes like [tɬʰ] should be treated as clusters or as single phonemes. Hamp chooses the cluster interpretation, keeping the phonemic inventory small. I have chosen to interpret them as single phonemes (though writing them with digraphs and trigraphs like /thl/), since they have the same distribution as simple phones like [t]. In part, this choice depends on personal taste; yet it may be significant that comparative studies show many of these phonetic complexes to be developments of simple phones. Thus the /tr/ affricate of my Lushai data corresponds to the retroflex stop /ṭ/ of Burling's. The hypothesis that the stop is historically prior is supported by the correspondences between Lushai and Khyang (spoken in East Pakistan): Lushai initial /tr/ or /ṭ/, final /r/, corresponds to Khyang /k/.[4] If directions of historical development may be considered to reflect structural pattern, then the choice to interpret the Lushai phonetic complexes as single phonemes may have more than a merely aesthetic basis.

UNIVERSITY OF CALIFORNIA, LOS ANGELES

[3] Lushai Phonemics, Indian Linguistics 17.148–55; Singing in Lushai, Indian Linguistics 17.24–28 (1957).

[4] Cf. my review of D. and L. Bernot, Les Khyang des Collines de Chittagong, Lg. 36. 184–86 (1960).

A CORRECTION

An editorial error marred the note Linguistics, by Robert P. Stockwell, IJAL 26.146. The next to the last sentence in this note should read as follows:

"One might go on to mention as touching upon, contributing to, or partaking of linguistics such diverse fields as acoustic physics and behavioral psychology, anatomy and aphasia, archeology and aesthetics—the list is a long one."

The Editors apologize both for creating the field 'acoustic aesthetics' and ascribing this creation to Professor Stockwell.

ABSTRACTS AND TRANSLATIONS: AN ANNOUNCEMENT

The editors of IJAL announce a new section, Abstracts and Translations, under the editorship of Dell H. Hymes.

The primary purpose of the new section will be to abstract articles appearing in other journals which concern (1) American Indian languages, (2) anthropological linguistics, (3) theoretical points of general interest. An attempt will be made to cover the leading linguistic and anthropological journals in Europe, American—including Latin America—Africa and Asia. All abstracts will be written in English, regardless of the language in which the original journal article was written.

In addition, articles of extraordinary interest appearing in a language not generally accessible to scholars in the western tradition, will be given more detailed abstracts and, in some instances, will be translated in their entirety.

The editors earnestly solicit the collaboration of scholars in the preparation of abstracts of any journal articles they consider relevant for the new Abstracts and Translations section of IJAL. All abstracts and correspondence relating to Abstracts and Translations should be sent to Dell H. Hymes, Kroeber Hall, University of California, Berkeley 4, California.

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